# flexicare®

TOTAL QUALITY - TOTAL CARE

- OXYGEN THERAPY
- BREATHING SYSTEMS
- BREATHING FILTERS & HMEF's
- ANAESTHETIC FACE MASKS
- LARYNGOSCOPES
- ET TUBES
- LARYNGEAL MASK AIRWAYS
- RESUSCITATION
- SUCTION TUBING
- UROLOGY
- ENEMA TIPS & ACCESSORIES

# Flexicare Medical Limited

Based in South Wales, Flexicare has a purpose built plant incorporating clean rooms, modern manufacturing equipment and warehousing facilities, which all combine to make a fast response to customers' demands.

All manufacturing operations are carried out in Clean Rooms with strict Quality Control Procedures ensuring that high standards are maintained throughout the production process.

## Technical

Flexicare is strongly committed to advanced design, product development and new manufacturing techniques. This supports continuous product innovation and provides a fast response to current and future market needs.

## Manufacturing

Flexicare has over two decades of experience in the manufacture of medical devices, and has built a world class reputation for the manufacture and supply of disposable medical devices to healthcare organisations both in the UK and overseas.

## Customer Care

The Customer Care Department is available to respond to your enquiries and provide on-line information regarding our product range and to discuss your order requirements. Our Experienced Sales Team can offer advice and educational support within the rapidly changing hospital environment.

## Accreditation

Flexicare is an ISO 13485 Registered Manufacturer of sterile medical devices and surgical products with CE mark Accreditation. Flexicare is also registered with the USA Food and Drug Administration (FDA).

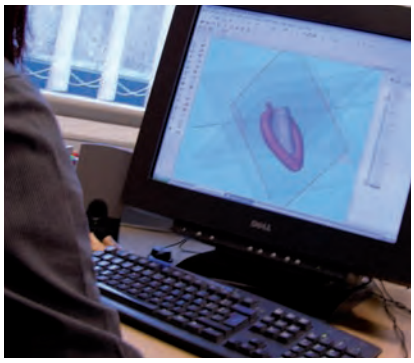
**All Flexicare products are Latex free**.

**US FDA Reg No 8021995**

**Total Quality - Total Care**

# Flexicare Medical Limited

Images Shown: **Opposite page** - Flexicare Medical's Headquarters, Customer Services Department. Product Testing.
**Below** - Manufacturing. Technical - Design and Development. Financial Department. Customer Services and Logistics.



Flexicare Medical Limited, Cynon Valley Business Park, Mountain Ash.
Mid Glamorgan. CF45 4ER. UK

✆ +44 (0)1443 474647 +44 (0)1443 474222 @ enquiries@flexicare.com

www.flexicare.com


## Flexicare products are marketed under the following trade marks:

**Venticaire®**
Oxygen and Aerosol Therapy & Airway management products

**Ventimask®**
Oxygen Therapy products

**MaxiNeb®**
Aerosol Therapy products

**Ventiflow™**
Anaesthetic breathing systems

**VentiSorb®**
Carbon dioxide absorbent

**VentiSeal™**
Endotracheal Tubes

**NasoSafe®**
Nasopharyngeal airway products

**LarySeal™**
Laryngeal Mask Airway products

**BriteBlade™**
Single Patient use fibre-optic Laryngoscope blades

**epiflex®**
Barium Enema tips & accessories

**flexicare®**
Continence products

All Flexicare products are Latex free

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Total Quality - Total Care

# Oxygen & Aerosol Therapy

# Oxygen Therapy


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# Oxygen

**Oxygen** is the most important single substance in animal biology. It constitutes nearly **50%** of the mass of our planet, **21%** of the air we breathe, **50%** of rock and **89%** of water. And yet it took man a surprisingly long time to discover the significance of oxygen in terms of combustion, respiration and animal metabolism.

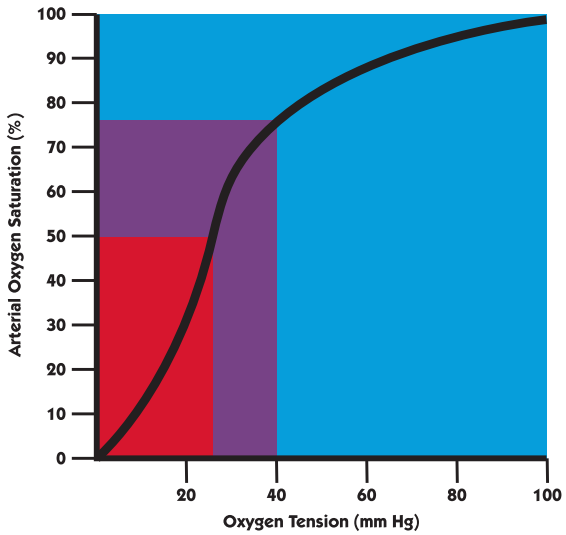
Oxygen is essential for normal respiration in aerobic organisms. Upon entering the lungs, $O_2$ molecules dissolve in the lipid and aqueous phase of tissues and diffuse across alveolar membranes and into alveolar capillaries. The vast majority of oxygen is bound to haemoglobin and only a small fraction of less than 2% is dissolved in the plasma. Following the transport to various tissues, oxygen diffuses into the cells for metabolism.

### Objective of Oxygen Therapy

Normally, a reduction in arterial oxygenation is compensated for by an increase in cardiac output to avert tissue hypoxia.

When this ceases to be adequate, tissue hypoxia is accompanied by acidosis, a fall in standard bicarbonate and pH. Oxygen therapy becomes necessary when the arterial oxygen tension lies on the steep part of the oxyhaemoglobin dissociation curve (see below) i.e. below 50mm Hg.

### Oxyhaemoglobin Dissociation Curve




The objective of oxygen therapy is to increase arterial oxygen tension, so that normal $O_2$ delivery to the tissue is restored. The essential aim of oxygen therapy in respiratory disorders is to keep out of the shaded zones and prevent further clinical deterioration. Patients rarely remain viable with arterial blood values in the red area (25mm Hg or below).

### Oxygen Administration Methods

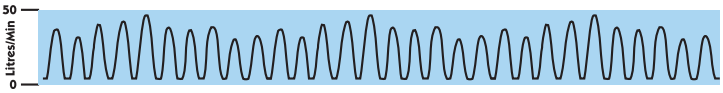
Oxygen therapy devices for the spontaneously breathing patient fall into two categories, **Variable performance** and **Fixed performance.**

## 1 Variable Performance

These devices administer uncontrolled oxygen therapy, because the patient creates the inspired mixture by the act of breathing. Examples of these are nasal catheters, nasal cannulae and mask shells with or without a rebreathing bag (see pictures below).

Various factors cause unpredictability in knowledge and control of inspired oxygen concentration when using these devices.

Firstly, because the oxygen flow is less than the patient's inspiratory flow, the patient obtains some oxygen and some air, but in unknown proportion because normal breathing has an irregular pattern:




The resulting oxygen concentration varies not only on a breath by breath basis, but also from patient to patient. Secondly, the size of the mask, size and placement of the vents and fit of the mask to the face will cause variation in inspired oxygen concentrations.

### Variable performance devices

**Low capacity masks shell**

**Nasal cannula**

**High capacity systems (non re-breathing mask)**

**Nasal catheter**

The disadvantage of using a variable performance device is that blood gas values cannot be easily interpreted since they only reflect performance variation of the mask/patient interface rather than a true change in the condition of the lungs under treatment.

## 2 Fixed Performance

These devices (see pictures below) allow controlled (known, fixed and selectable) oxygen dosage. They create a constant proportion of air/oxygen mixture in excess of patient inspiratory flow rate and are independent of patient factors or fit to the face. With gas flow constantly in excess of patient demand and with enhanced $CO_2$ washout, rebreathing is virtually eliminated.

**Venturi mask** **Ventimask**

To work efficiently and to prevent air dilution a fixed performance device should incorporate

- A large volume face piece (not less than 280ml).
- Gas mixture flowing directly towards the nose and mouth.
- Vents positioned well away from the patient airway.

For details on how a fixed performance mask works refer to the illustration on page 8.

Fixed performance devices are sometimes referred to as venturi or air entrainment masks.

| Respiratory Disorder | Result | Causes |
|---|---|---|
| Ventilatory Failure | Low minute Volume (Decreased Alveolar ventilation) | **Central Nervous System**<br>Self Poisoning Anaesthesia<br>**Peripheral Nervous System**<br>Guillian-Barré syndrome Poliomyelitis<br>**Neuromuscular**<br>Myathena Gravis<br>Neuromuscular blocking drugs<br>**Skeletal**<br>Fractured ribs → Flail chest |
| Inappropriate relationships between blood and gas in alveoli<br>Ventilation abnormalities | Ventilation exceeds perfusion (increased dead space → decreased alveolar ventilation) | **Chronic $CO_2$ retention** as a result of long-standing obstructive airways disease |
| Perfusion Abnormalities → | Perfusion exceeds ventilation (venous admixture or shunting) → | **Pneumonitis** from any cause:<br>Infective pneumonia<br>Lung contusion<br>Shock lung<br>Acid aspiration, etc.<br>Lung Congestion of cardiac failure |

# Rationale for controlled oxygen therapy

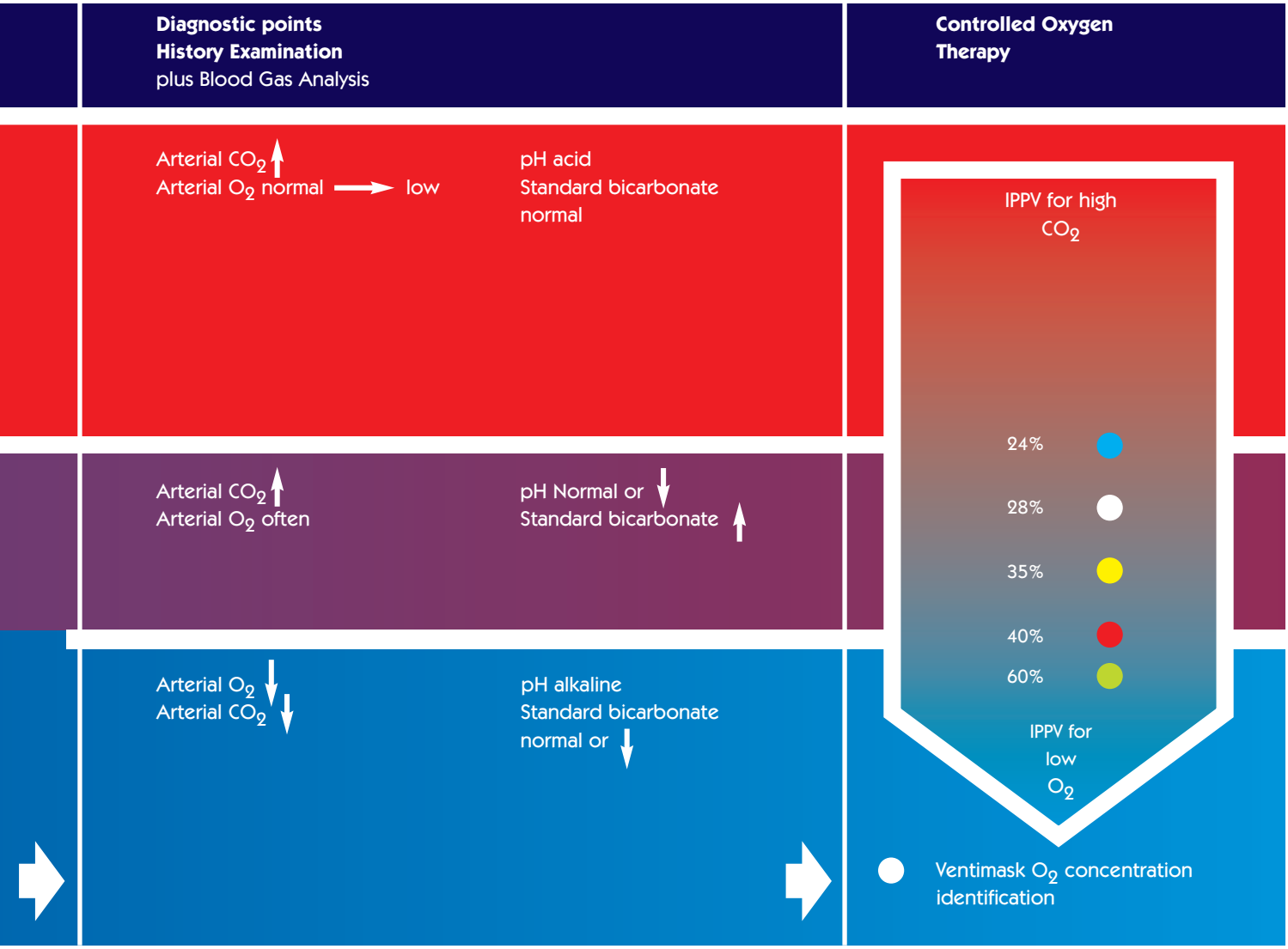
Excess oxygen can be harmful. Like many drugs, oxygen can be associated with toxicity and excess oxygen can be harmful to the lungs (pulmonary endothelium). The use of inspired oxygen greater than 60% should be avoided if possible. Decreasing the amount of supplemented oxygen at the earliest possible time should be routine practice.

1 Irrespective of the cause, hypoxia should be treated using a Ventimask which gives an appropriate dosage, to bring oxygen tension and saturation to near normal.

2 When acute ventilatory failure exists, indicated by $CO_2$ retention, then $O_2$ therapy is only indicated if there is a concomitant hypoxia. Examples would be; CNS depression, Guillian-Barré syndrome and flail chest, all of which require treatment by IPPV if severe.

3 When chronic ventilatory failure and $CO_2$ retention occur such as in chronic bronchitis and emphysema, patients rely on hypoxia to drive respiration. Excess $O_2$ dosage in such patients will thus cause respiratory depression and narcosis. However, they will benefit from a small increase in inspired $O_2$. 24% and 28% Ventimasks are appropriate under these circumstances and will produce dramatic improvement in saturation and levels of consciousness.

4 Where there is excess shunting of venous blood without $CO_2$ retention, as in infective pneumonia, direct lung trauma or contusion, shock lung, acid aspiration syndrome, or chronic congestive cardiac failure, higher oxygen concentrations (35%-60%) are often required and can be administered safely. Monitoring of arterial oxygen while Ventimasks are in use will indicate whether the lungs are improving or deteriorating. When parenchymal lung failure is so severe that 60% inspired oxygen is not sufficient to achieve satisfactory blood oxygen levels, IPPV is indicated even if alveolar ventilation assessed by $CO_2$ measurement is adequate. In the flow chart below, selection of the appropriate Ventimask is related to the various types of respiratory disorders.

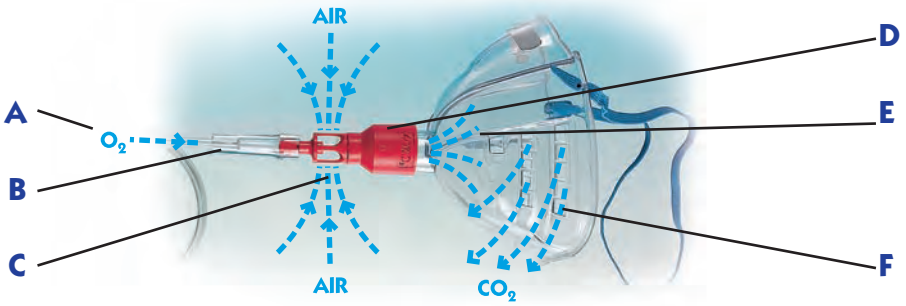


# How a fixed performance mask works

### a) Principles of operation

A fixed performance device utilises the HAFOE principle (High Air Flow with Oxygen Enrichment). $O_2$ **(A)** flows into a jet **(B)** to entrain air through apertures **(C)** in the venturi barrel **(D)**. The resultant air/oxygen mixture containing the prescribed $O_2$ concentration flows into the face piece **(E)** for patient breathing. Surplus gas leaves the mask through the holes **(F)** to flush out expired $CO_2$.

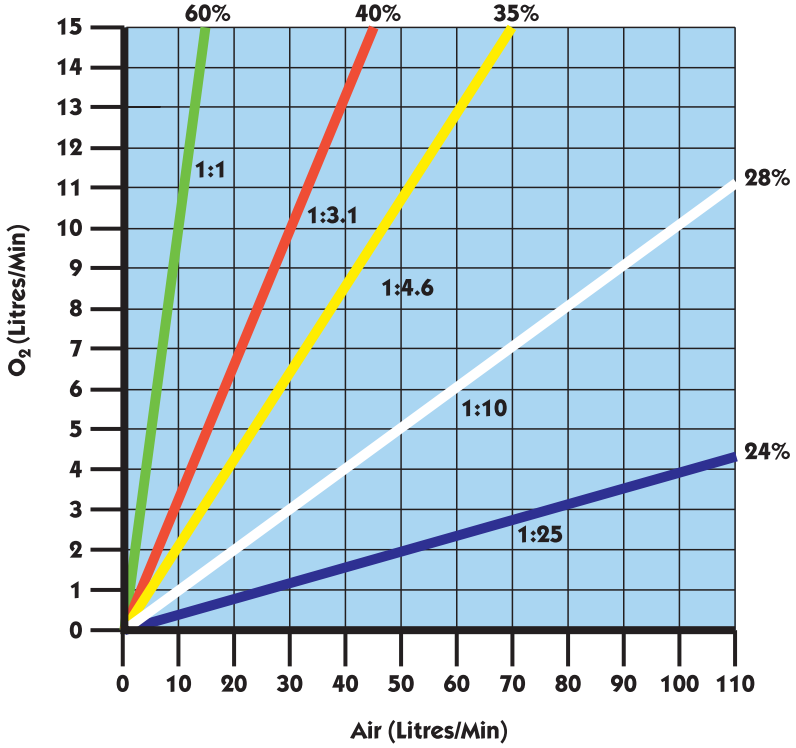
When oxygen flow is increased, more air is entrained, to maintain a constant oxygen concentration.




### b) Calculating total gas mixture flow rates

In most clinical situations the minimum recommended oxygen flow rate will entrain sufficient air to provide a gas mixture flow rate to match or exceed the patient's inspiratory flow rate.

If a patient is known to be hyperventilating it may be necessary to increase the oxygen flow rate to generate a greater gas mixture flow to ensure this is in excess of patients demand. Using the mixing graph the total gas flow rate available to the patient can be assessed.




### Example

24% Ventimask

At the minimum $O_2$ flow rate of 2 litres/min, this mask will generate a total flow rate of 52 litres/min. To calculate the total flow rate from the same mask if $O_2$ flow is increased to say 4 litres/min, simply look for 4 litres/min on the vertical axis of the graph and follow the horizontal line unit it intersects the 24% line. At this point of the intersection look to see what air flow rate on the horizontal axis is appropriate. In this case it is 100 litres/min. Add the $O_2$ flow rate for the final mixture flow rate. 100 (air entrained) + 4 (oxygen flow) = 104 litres/min.

Similar calculations can be carried out for the remaining mask concentrations at varying $O_2$ flow rates.

**In summary, note that the increasing $O_2$ flow rate maintains the $O_2$ concentration but delivers it at a higher flow rate.**

# Ventimask®

**Clinically Proven...** "only Ventimask is able to provide a fixed and predictable oxygen concentration with changing and variable breathing patterns" [1]

Ventimask® is the accepted standard for controlled oxygen therapy for exact oxygen concentration delivery, optimum clinical performance with greater patient acceptability.

**Latex Free Straps**
Air dilution is minimised due to **Large Capacity** 280ml face piece
**Soft and Flexible** facemask ensures maximum comfort during sleep
Eye irritation is avoided due to **Horizontal Gas Flow** ensuring delivery to mouth and nose
Extraneous air dilution is greatly reduced by **Exhalation Vents** enhancing $CO_2$ washout and prevents pressure build up

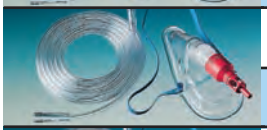
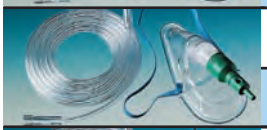
**Lower input oxygen flows are required when compared to other fixed performance (venturi) masks. Fixed and predictable oxygen concentrations are unaffected by variable breathing patterns, inspiratory flow and mask fit.**

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 037-10-001 | Ventimask with 24% Blue Venturi (2 litres/minute) | Box of 50 |
| | 037-10-002 | Ventimask with 28% White Venturi (4 litres/minute) | Box of 50 |
| | 037-10-003 | Ventimask with 35% Yellow Venturi (8 litres/minute) | Box of 50 |
| | 037-10-004 | Ventimask with 40% Red Venturi (10 litres/minute) | Box of 50 |
| | 037-10-005 | Ventimask with 60% Green Venturi (15 litres/minute) | Box of 50 |
| | 037-10-006 | Ventimask with 28% White Venturi in situ (2 litres/minute - for use at home) | Box of 40 |
| | 037-10-007 | Ventimask No Venturi | Box of 50 |
| | 037-10-008 | Ventimask Low $0_2$ Concentration Set with 24%, 28% & 35% Venturi | Box of 50 |
| | 037-10-009 | Ventimask High $0_2$ Concentration Set with 40% & 60% Venturi | Box of 50 |
| | 037-10-012 | Ventimask with 5 Venturies 24%, 28%, 35%, 40% & 60% | Box of 40 |

# Single Venturi Masks

These masks sometimes called High Air Flow $O_2$ Enrichment (HAFOE) masks incorporate a Venturi Barrel and uses the Bernoulli principle to deliver a predetermined and fixed concentration of $O_2$ to the patient regardless of the patient's respiratory pattern, by providing a higher gas flow than the peak inspiratory flow rate. Due to the exhalation holes on the mask, expired gas is flushed out resulting in minimal rebreathing and little increase in dead space.

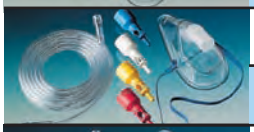
**The performance of small venturi masks are not considered to be as accurate as large volume masks. The concentration is very much dependent on patients breathing rate and minute volume.**

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 032-10-040 | Adult Venturi Mask 24% | Box of 50 |
| | 032-10-040T | Adult Venturi Mask 24% with Tubing | Box of 50 |
| | 032-10-041 | Adult Venturi Mask 28% | Box of 50 |
| | 032-10-041T | Adult Venturi Mask 28% with Tubing | Box of 50 |
| | 032-10-042 | Adult Venturi Mask 35% | Box of 50 |
| | 032-10-042T | Adult Venturi Mask 35% with Tubing | Box of 50 |
|  | 032-10-043 | Adult Venturi Mask 40% | Box of 50 |
| | 032-10-043T | Adult Venturi Mask 40% with Tubing | Box of 50 |
|  | 032-10-044 | Adult Venturi Mask 60% | Box of 50 |
| | 032-10-044T | Adult Venturi Mask 60% with Tubing | Box of 50 |
| | 032-10-050 | Paediatric Venturi Mask 24% | Box of 50 |
| | 032-10-050T | Paediatric Venturi Mask 24% with Tubing | Box of 50 |
| | 032-10-051 | Paediatric Venturi Mask 28% | Box of 50 |
| | 032-10-051T | Paediatric Venturi Mask 28% with Tubing | Box of 50 |
| | 032-10-052 | Paediatric Venturi Mask 35% | Box of 50 |
| | 032-10-052T | Paediatric Venturi Mask 35% with Tubing | Box of 50 |
| | 032-10-053 | Paediatric Venturi Mask 40% | Box of 50 |
| | 032-10-053T | Paediatric Venturi Mask 40% with Tubing | Box of 50 |
| | 032-10-054 | Paediatric Venturi Mask 60% | Box of 50 |
| | 032-10-054T | Paediatric Venturi Mask 60% with Tubing | Box of 50 |
| | 032-10-055T | Paediatric Venturi Mask with 5 Venturies 24%,28%,35%,40%,60% with Tubing | Box of 50 |

# Aerosol Masks, Multi Venturi Masks & Venturi Barrels

When the required concentration needs to change during oxygen therapy, the adult aerosol mask, with the choice of 6 venturies or a multi venturi mask kit will offer the choice to suit the individual patients requirements. The aerosol mask can be used with a nebuliser or 22mm corrugated tubing for combined oxygen therapy and humidification.

| Blank Venturi | 24% 2 litres/ minute | 28% 4 litres/ minute | 31% 6 litres/ minute | 35% 8 litres/ minute | 40% 10 litres/ minute | 60% 15 litres/ minute |
|---|---|---|---|---|---|---|

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 032-10-006 | Adult Aerosol Mask | Box of 50 |
| | 032-10-006NC | Adult Aerosol Mask with Nose Clip | Box of 50 |
| | 032-10-010 | Paediatric Aerosol Mask | Box of 50 |
|  | 032-10-024 | Adult Mask with 4 Venturies 24%, 28%, 35% & 40% | Box of 50 |
| | 032-10-025 | Adult Mask with 4 Venturies 24%, 28%,35% & 40% with Tubing | Box of 50 |
| | 032-10-026 | Adult Mask with 2 Venturies 40% & 60% | Box of 50 |
| | 032-10-027 | Adult Mask with 2 Venturies 40% & 60% with Tubing | Box of 50 |
| | 032-10-028 | Adult Mask with 5 Venturies 24%, 28%, 35%, 40% & 60% | Box of 50 |
| | 032-10-028T | Adult Mask with 5 Venturies 24%, 28%, 35%, 40% & 60% with Tubing | Box of 50 |
| | 032-10-028NC | Adult Mask with 5 Venturies 24%, 28%, 35%, 40% & 60% with Nose Clip | Box of 50 |
| | 034-10-026 | Venturi Barrel 24% Blue | Box of 50 |
| | 034-10-027 | Venturi Barrel 28% White | Box of 50 |
| | 034-10-032 | Venturi Barrel 31% Orange | Box of 50 |
| | 034-10-028 | Venturi Barrel 35% Yellow | Box of 50 |
| | 034-10-029 | Venturi Barrel 40% Red | Box of 50 |
| | 034-10-030 | Venturi Barrel 60% Green | Box of 50 |
| | 034-10-031 | Blank Venturi (Oxygen Connector) | Box of 50 |

# Medium Concentration Mask

Venticaire® Medium Concentration Mask is a small capacity, variable performance mask designed for use when precise control of inspired oxygen concentration is not mandatory. Venticaire MC mask at a flow rate of 6-8 litres/minute delivers an oxygen concentration of 40% to 50% depending on patients breathing rate and tidal volume.

**Clear Observation of face colour and vital signs** Mask is made of colourless and transparent soft pvc to allow visual inspection.

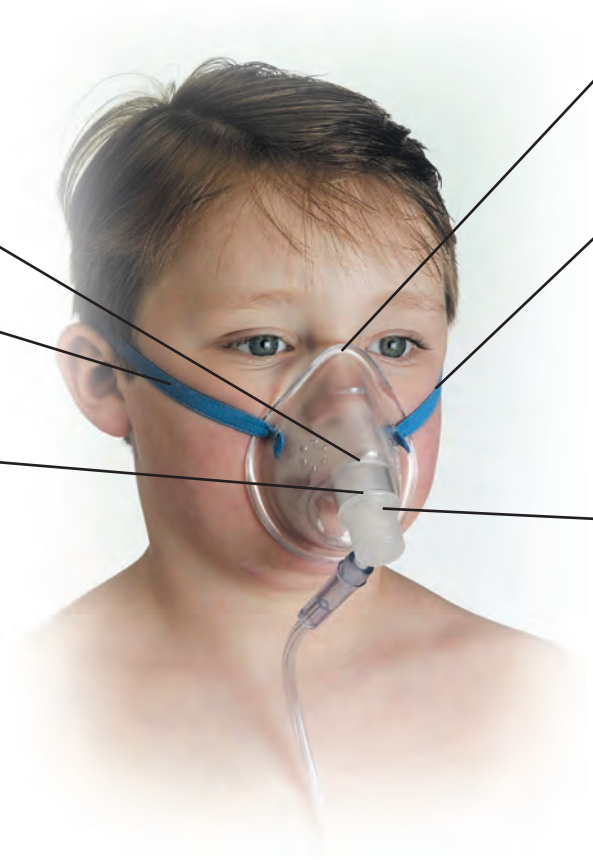
**Reduces patient's eye irritation**

The angled $O_2$ Inlet directs oxygen into the nostrils, not upwards towards the eyes.

**Patient Comfort** The adult mask is offered with headstrap or earloops. This will allow easy fitting of the mask to patients whose head movements need to be restricted.

**Stepped Oxygen Inlet** ensures easy and safe connections to oxygen tubing.

**Nose Clip** The adult mask is also available with a nose clip. The products can be identified by an NC suffix.



**Eliminate Risk of Patient Injury**

The design of the plastic nose bridge has eliminated the need for a Metal Nose bridge thus eliminating the risk of injury to patients especially children.

**Eliminated Risk of Latex Allergy**

Latex free mask and elastic bands eliminates the risk of allergic reaction to latex.

**Easy fit with good seal ensuring patient comfort**

The soft and pliable mask moulds easily to the patient's face. The feather rim provides maximum comfort to the patient.

**Swivel Connector**

The swivel connector fits to all oxygen connecting tubes meeting ISO standards and provides maximum patient comfort by allowing to be rotated to the required position.

**All Masks are supplied with Knitted Latex Free Straps. The knitted strap maintains its width when stretched and this will reduce the pressure on patients skin and can protect patients from pressure sores.**

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 032-10-001 | Adult MC Mask with Head Strap | Box of 50 |
| | 032-10-002 | Adult MC Mask with Head Strap and Tubing | Box of 50 |
| | 032-10-002NC | Adult MC Mask with Nose Clip, Head Strap and Tubing | Box of 50 |
| | 032-10-013 | Adult MC Mask with Earloops | Box of 50 |
| | 032-10-014 | Adult MC Mask with Earloops and Tubing | Box of 50 |
| | 032-10-014NC | Adult MC Mask with Nose Clip, Earloops and Tubing | Box of 50 |
| | 032-10-008 | Paediatric MC Mask with Head Strap | Box of 50 |
| | 032-10-009 | Paediatric MC Mask with Head Strap and Tubing | Box of 50 |

# Nasal Cannula & Nasal Catheters

Nasal Cannulae or nasal Catheters are used for their simplicity and patient convenience. There is entrainment of ambient air through the nostrils. The $FiO_2$ achieved is proportional to a) the flow rate of oxygen (1-6 l/min), b) the patients tidal volume, inspiratory flow rate, and c) the volume of the nasal pharynx.Mouth breathing causes inspiratory air flow which produces a venturi effect in the posterior pharynx entraining oxygen from the nose.

At an oxygen flow rate of 2 l/min the oxygen concentration in the hypopharynx of a resting person is 25-30%. Nasal Cannula prevents re-breathing and are comfortable for long periods.

There is increased patient compliance with nasal cannulae as patients are able to speak, eat or drink. Local irritation and dermatitis may occur with high flow rates. Use of humidified oxygen is recommended to reduce dryness of the mucousal wall in the nasal cavities, particularly when using flows of greater than 4 l/min.

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 032-10-020 | Adult Nasal Cannula | Box of 100 |
| | 032-10-022 | Adult Nasal Cannula with Tubing | Box of 100 |
| | 032-10-100 | Sterile Nasal Catheter | Box of 100 |
| | 032-10-101 | Adult Soft Tip Curved Nasal Cannula with Tubing | Box of 100 |
| | 032-10-102 | Adult Soft Tip Curved Nasal Cannula without Tubing | Box of 100 |
| | 032-10-103 | Paediatric Soft Tip Curved Nasal Cannula with Tubing | Box of 100 |
| | 032-10-104 | Paediatric Soft Tip Curved Nasal Cannula without Tubing | Box of 100 |
| | 032-10-105 | Neonatal Soft Tip Curved Nasal Cannula with Tubing | Box of 100 |
| | 032-10-108 | Adult Nasal Cannula with $C0_2$ Monitoring | Box of 100 |
| | 032-10-109 | Adult Nasal Cannula with $0_2$ / $C0_2$ Combination Monitoring | Box of 100 |
| | 032-10-114 | Adult High Flow Soft Tip Nasal Cannula | Box of 100 |
| | 032-10-115 | Infant Soft Tip Nasal Cannula | Box of 100 |
| | 032-10-116 | Premature Soft Tip Nasal Cannula | Box of 100 |

# Non Rebreathing Mask

The Non Rebreathing Mask provides a high concentration of oxygen and the reservoir bag allows for adequate oxygen to be available to meet the unpredictable patient's breathing pattern and tidal volume. It is mainly recommended for Paramedic and Accident & Emergency departments. To ensure patient safety the mask is now totally latex free.

**Reduced Risk of Patient Trauma**

The elasticated earloop bands on the adult mask eliminate the need for the patient's head to be moved to apply the mask, reducing the risk of further injury to the traumatised patient.

**Reduced Risk of Bag Occlusion**

The castelation on the swivel connector ensures the flow of oxygen from the bag to the patient is uninterrupted.

**Star Lumen Tubing , Secured Oxygen Delivery**

Star Lumen Tubing, supplied with British Standard conforming connectors, ensures that the flow of oxygen is maintained even if the tube is accidentally kinked.

**Ease and Speed of Fitting the Mask**

The swivel connector and earloops allow the mask to be fitted swiftly with the connector being rotated to suit the patient's position.

**Totally Latex Free**

Eliminates the risk of allergic reaction to latex.

**Adult Non Rebreathing Mask with Head Strap**

**Adult Non Rebreathing Mask with Earloops**

**Paediatric Non Rebreathing Mask with Head Strap**

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 032-10-070 | Adult Non Rebreathing Mask with Earloops & Tubing | Box of 50 |
| | 032-10-071 | Adult Non Rebreathing Mask with Earloops | Box of 50 |
| | 032-10-072 | Adult Non Rebreathing Mask with Head Strap & Tubing | Box of 50 |
| | 032-10-072NC | Adult Non Rebreathing Mask with Nose Clip, Head Strap & Tubing | Box of 50 |
| | 032-10-073 | Adult Non Rebreathing Mask with Head Strap | Box of 50 |
| | 032-10-080 | Paediatric Non Rebreathing Mask with Tubing | Box of 50 |
| | 032-10-081 | Paediatric Non Rebreathing Mask | Box of 50 |

# Oxygen T-Piece, Gilston & Tracheostomy Mask

## Oxygen T-Piece

Oxygen T-Piece is used for delivering oxygen in the recovery room to patients with a laryngeal mask in situ.

**Clinically Tested for oxygen Concentration Accuracy**

Confidence in providing your patient with the precise level of oxygen prescribed.

**Crystal Clear Connector**

Allowing Visual Observation of mist formation confirming breathing function.

**Complying to the British Standard BS EN 13544-3**

Assures compatibility with all British standard compliant connectors.

**Wide Range of Venturi Barrels**

Providing a choice to meet individual patient needs (24%, 28%, 31%, 35% & 40%).

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 032-10-540 | 40% Oxygen T-Piece | Box of 50 |

## Gilston T-Piece

Gilston T-Piece is designed to provide oxygen to patients with tracheostomy tubes. The sliding cover allows easy access for suction and a venturi could be fitted to one end of the tube to provide oxygen at the required concentration or combined with a humidity adaptor for humidification (see page 18).

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 5060 | Adult Gilston T-Piece | Box of 5 |
| | 5061 | Paediatric Gilston T-Piece | Box of 5 |

## Tracheostomy Mask

Tracheostomy masks are provided with a stud button non latex strap with a 360 swivel connector for maximum patient comfort. The connector is 22mm allowing for connection to corrugated tubing and providing humidified oxygen when used with a venturi and humidifier adaptor (see page 18).

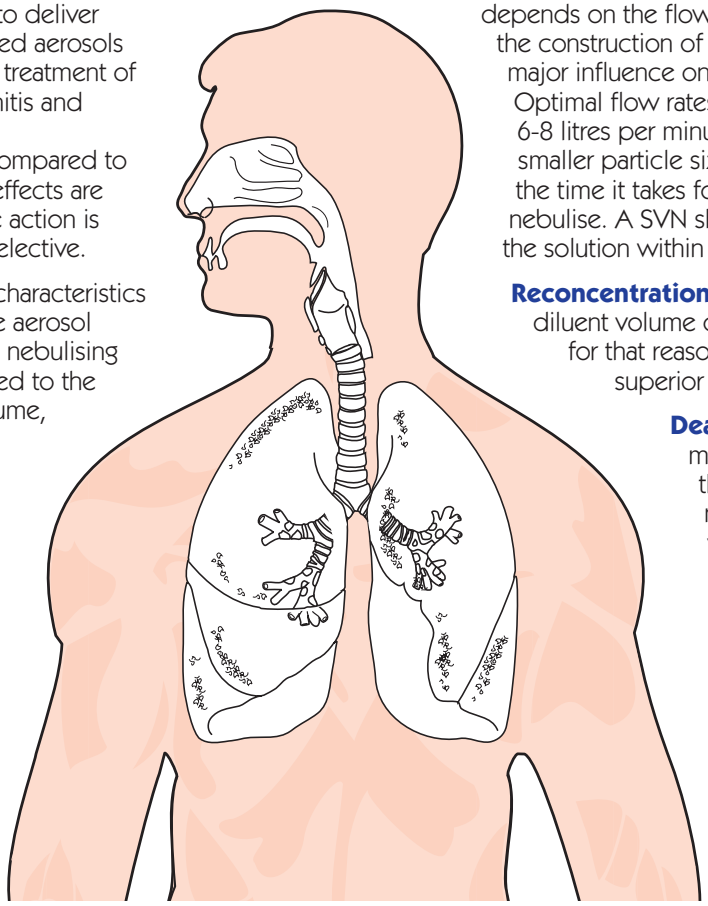
| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 032-10-091 | Adult Tracheostomy Mask | Box of 50 |
| | 032-10-092 | Paediatric Tracheostomy Mask | Box of 50 |

# Aerosol Therapy Explained

**Medication Nebulisers** also referred to as small volume or jet nebulisers (SVN) are devices used to turn medication into an aerosolised mist to deliver directly into the patient's lungs. Inhaled aerosols have considerable advantages in the treatment of many lung diseases including bronchitis and cystic fibrosis.
The required dose is much smaller compared to that taken systemically and the side effects are therefore negligible. The onset of the action is quicker, and the drug itself is more selective.

**Nebuliser Performance** Important characteristics of nebuliser performance include the aerosol particle size generated, drug output, nebulising time and the amount of drug delivered to the patient. Device construction, fill volume, flow temperature, humidity of the driving gas are factors affecting the performance of a nebuliser.

**Particle Size** is an important characteristic of nebuliser performance. Large particles do not reach the lower respiratory tract depositing themselves in the mouth, upper airways and gastric tract. Particles too small will not be taken up by the alveoli and are exhaled. Respirable particles taking part in lung deposition has been accepted to range from 0.5 microns to 5.0 microns in diameter size.



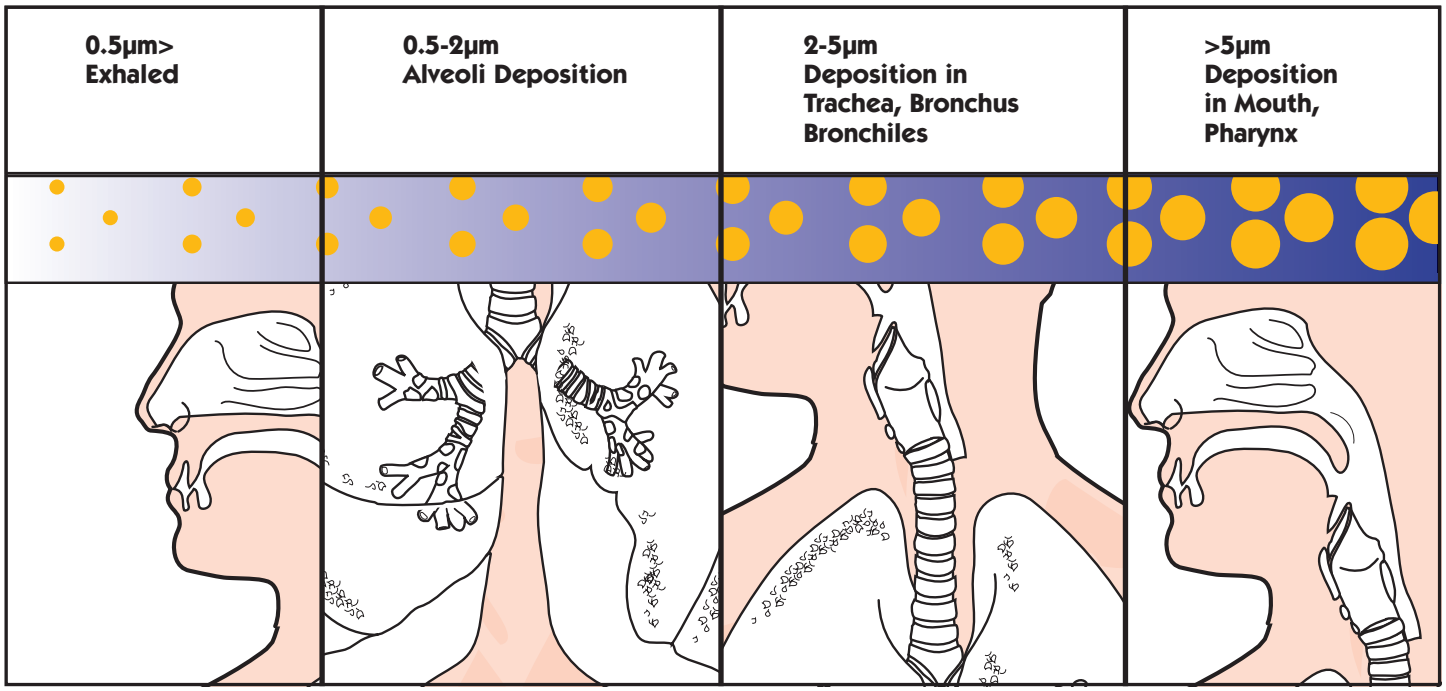
**Nebulising Time** is the time from starting nebulisation until continuous nebulisation has ceased and depends on the flow rate, compressed air and the construction of the nebuliser. These are a major influence on aerosol size distribution. Optimal flow rates recommended are between 6-8 litres per minute, with 8 l/min providing a smaller particle size and shorter nebuliser time, the time it takes for the volume to completely nebulise. A SVN should deliver at least 80% of the solution within 15 minutes.

**Reconcentration** in a SVN is greater at a diluent volume of 2ml than one of 4 ml and for that reason it is suggested 4ml maybe superior than 2ml as a diluent formula.

**Dead Volume** is the volume of medication not delivered to the patient during nebulisation and exists as the volume left in the nebuliser at the end of nebulisation.

**Respirable Mass** is the combination of aerosolised drug output and the percentage of particles in the respirable range. This is the amount of aerosolised drug available to the patient on inspiration.

## Aerosol Particle Deposition



# MaxiNeb®
# Nebuliser

MaxiNeb is a high output nebuliser which delivers medication quickly and efficiently. In comparing the performance of nebulisers for Dead Volume, Nebulising Time, MMAD and percentage of aerosol mass in the respirable range, MaxiNeb performed among the most efficient in each of these categories.

## Patient Choice
22mm connector allows MaxiNeb to be connected to either an aerosol mask or mouth piece providing users choice of delivery.

## Easy Dilution
The chamber has clearly visible graduation marks to facilitate easy dilution of drugs as necessary.

## Anti-Spill Cap
The easy ¼ turn closing design of the cap provides confidence in a secure seal whilst also incorporating a large 10ml reservoir to reduce the risk of spillage.

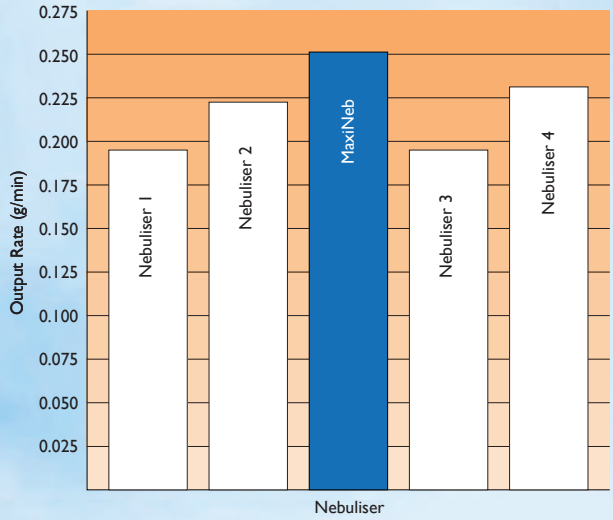
## Clear Construction
Allows clinicians to view the nebulisation of the drug and provides visual assurance of the functioning device.

## Stable Stand Design
The wide legs of the MaxiNeb provides a stable upright position.

## Specification

- Large volume medication chamber capacity of 15ml, allows for high rate of dilution of drugs when required.
- Graduation marking on the chamber, assisting drug dilution when required.
- Low Dead Volume (1.1ml).
- Nebulisation time of 8-10 minutes.
- Anti Spill cap design with large capacity (10ml).
- Efficient nebulising in upright position and at angles up to 45°.
- Leak proof and Secure Seal, ¼ turn closing design.

| | MMAD (micron) | % between 1-5micron |
|---|---|---|
| MaxiNeb | 4.18 | 56.42 |
| Leading Nebuliser | 5.48 | 45.91 |




The above chart shows that MaxiNeb produces the highest output rate in comparison to other nebulisers. MaxiNeb's fast nebulisation time of 9 minutes compared to an average 12 minutes, allows the required medication to be delivered to the lungs and alveoli, helping with patient compliance.

# MaxiNeb® Compressor

The new MaxiNeb Compressor was developed in conjunction with MaxiNeb Nebuliser to provide a complete system for both hospital and home use to deliver different medications.

## Clear Instructions

In addition to the User Manual, the operational information is visible through the clear case construction for quick reference.

## Changeable Air Filter

MaxiNeb has a interchangeable filter easily changed by the user.

## Quiet Operation

The modern design of the housing facilitates a low noise level output, minimising the ambient noise and reducing irritation to the user.

## Integrated Compartment

The MaxiNeb compressor has a dedicated compartment to safe keep the nebuliser and accessories, ensuring that all the necessary items are at hand when required.

## The MaxiNeb System

The MaxiNeb System comprises of: MaxiNeb Compressor, MaxiNeb Nebuliser, Aerosol Mask, Mouthpiece, Star Lumen Tubing, Instructional Manual.

## Operational Benefits

The MaxiNeb Compressor is very quiet when in use and produces 6 lpm, providing optimal output to the nebuliser to deliver the drug. When used in conjunction with MaxiNeb Nebuliser, systemic reaction to beta stimulators is reduced by the absence of large particles which are deposited in the mouth, pharyngeal and gastric tract.
Each MaxiNeb Compressor is supplied with all the essential items including clear instruction and operational guidance.

## Specifications

| | | |
|---|---|---|
| Electrical Rating (Note:Refere to the rating label on the product) | 100VAC, 60Hz, 1.2A<br>120VAC, 60Hz, 1.2A<br>230VAC, 60Hz, 0.6A | 100VAC, 50Hz, 1.2A<br>230VAC, 50Hz, 0.6A<br>230-240VAC, 50Hz, 0.6A |
| Maximum Compressor Pressure | Approx 35psi | Approx 35psi |
| Operating Flow Rate | Approx 6 lpm | Approx 5.5 lpm |
| Nebulisation Rate | 0.3 ml/min | |
| Particle Size | 0.5 ~ 5 microns* (tested for Sodium Fluoride) | |
| Classification | Class II. (not applicable for UL1431)<br>BF equipment (not applicable for UL1431)<br>IPXO<br>No AP/APG protection. | |
| Supplied Components | Mouthpiece<br>T-Piece<br>MaxiNeb Nebuliser<br>Mask<br>2.1 Metre Tube | |

| | | |
|---|---|---|
| Dimensions (WxDxH) | | 28.5 x 20.5 x 11.0 cm / 11.2″ x 8.1″ x 4.3″ |
| Weight | | 2.3 kg / 5.0 lb |
| Fuse (see note 3) | | T5A 250VAC for 120V system<br>T1.6A 250VAC for 230V system |
| Environment | Temperature | Operation: 10°C to 40°C / 50°F to 104°F |
| | | Storage: -15°C to 50°C / 5°F to 122°F |
| | | Transport: -15°C to 70°C / 5°F to 158°F |
| | Humidity | Operation: 10% to 90% RH non-condensing |
| | | Storage: 10% to 90% RH non-condensing |
| | | Transport: 10% to 90% RH non-condensing |

Note:
1. *Values are varied depending on the nebuliser used and type of drug used.
2. Consult distributor(s) or contact Flexicare Medical for additional technical documents.
3. The Nebuliser is fitted with a fuse as specified in the Specification column, it is designed to be maintained by the manufacturer or it's agents.

# Nebuliser and Aerosol Therapy Products

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 60011CN | MaxiNeb Compressor - Chinese / Australian Plug | Box of 1 |
| | 60022GB | MaxiNeb Compressor - British Plug (9R619001) | Box of 1 |
| | 60033FR | MaxiNeb Compressor - French Plug (9R619002) | Box of 1 |
| | 60044IT | MaxiNeb Compressor - Italian Plug | Box of 1 |
| | 032-10-003 | MaxiNeb Nebuliser | Box of 50 |
| | 032-10-004 | MaxiNeb Nebuliser with T-Piece and Mouthpiece w/o Tubing | Box of 50 |
| | 032-10-005 | MaxiNeb Nebuliser with T-Piece and Mouthpiece with Tubing | Box of 50 |
| | 032-10-007 | Adult Aerosol Mask with MaxiNeb Nebuliser and Tubing | Box of 50 |
| | 032-10-011 | Paediatric Aerosol Mask with MaxiNeb Nebuliser and Tubing | Box of 50 |
| | 032-10-015 | 22mm Nebuliser | Box of 50 |
| | 032-10-016 | Adult Aerosol Mask with 22mm Nebuliser and Tubing | Box of 50 |
| | 032-10-017 | Paediatric Aerosol Mask with 22mm Nebuliser and Tubing | Box of 50 |
| | 032-10-064 | 22mm Mouth Piece | Box of 100 |
| | 010-636 | T-Piece | Box of 100 |
| | 032-10-065 | 22mm Mouth Piece and T-Piece | Box of 100 |

# Humidity Adaptor and Bubble Humidifier

## Humidity Adaptor

Normally, enough moisture is present in ambient air entrained into a venturi barrel to provide sufficient humidification. Patients, however, with thick mucous secretions in the airway, undergoing controlled oxygen therapy may require additional humidification.

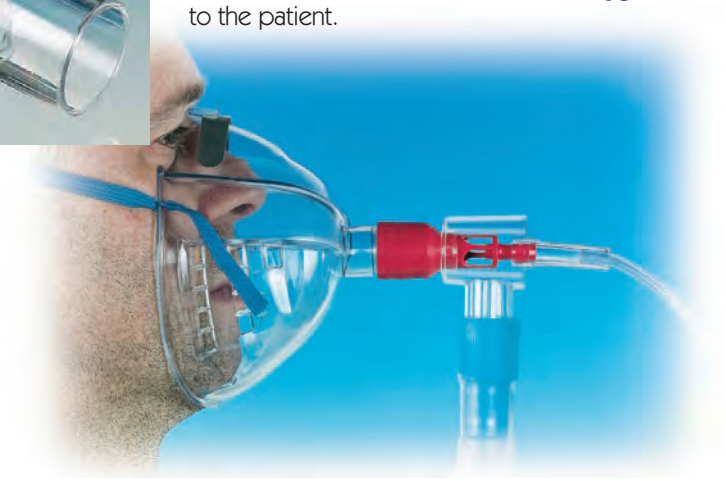
To provide this a humidity adaptor has to be attached to the venturi barrel, with the open end away from the mask and connected to either a large volume nebuliser or humidifier.

When oxygen is delivered at a flow rate of 1-4 l/min by mask, nasal cannula or nasal catheters, the oropharynx or nasopharynx provide adequate humidification. At a higher flow rate or when oxygen is delivered directly to the trachea, humidification is necessary.

Ultimately it might be necessary to increase the moisture content of the inspired gases in order to prevent the possible detrimental effect of dry gases on the airway structure. The humidity adaptor fixes over a venturi barrel and oxygen tubing is attached to the venturi barrel as normal. The adaptor has a 22mm arm which is connected to a humidifier via 22mm corrugated (elephant) tubing.

Humidified air is transported from the bubble humidifier or heated humidifier to the humidity adaptor, then it is mixed with fixed concentration oxygen.

This is the most accurate method of giving **Fixed Concentration Humidified Oxygen** to the patient.



| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 5506 | Humidity Adaptor 22mm | Box of 10 |

## Bubble Humidifier

Oxygen is a dry gas, when it is delivered in excess of 4 l/min or when using a Nasal Cannula or Nasal Catheter it is recommended that oxygen is humidified to prevent damaging the respiratory tract. Bubble humidifiers are used to provide humidified oxygen (cold humidification) to patients both at hospital and at home.

**Eliminate the Risk of Cross Contamination**

Single Patient Use.

**Safety Pressure Valve**

The pressure valve automatically opens at 6psi should the outlet line occlude.

**PVC Nipple Diffuser**

For home use the pvc nipple diffuser extends the life of the humidifier and eliminates the clogging of the diffuser apertures.

**Increased Humidification**

The ceramic filter at the end of inlet tube produces very small bubbles of gas, thus increasing contact surface providing maximum humidity picked up by the bubbles. At the same time the tiny bubbles produce very low noise unlike larger bubbles, helping patient rest.

**Recessed Nipple Connector with Screw Cap.**

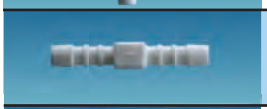
Protecting the connector from accidental breakage.

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 032-10-090 | Bubble Humidifier with PVC diffuser. 300ml, 6 psi. (Recommended for home use) | Box of 20 |
| | 032-10-089 | Bubble Humidifier with Ceramic difffuser 400ml, 4 psi. (Recommended for hospital use) | Box of 20 |

# Tubing, Water Traps & T-Pieces

In addition to our full range of products, a selection of Oxygen Tubes, Corrugated Tube, Water Traps and T-Piece are offered to provide maximum flexibility for clinicians to custom make the device that meets the specific patient's needs.

Venticaire® oxygen connecting tubes provide a wide choice to suit all applications. The table below provides product description and code numbers.

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 032-10-060 | Star Lumen (kink resistant) Oxygen Tubing with connectors 2.1 metre | Box of 100 |
| | 032-10-063 | Star Lumen (kink resistant) Oxygen Tubing with one narrow and one wide connector 2.1 metre | Box of 100 |
| | 032-10-059 | Star Lumen (kink resistant) Oxygen Tubing 100 metre | Box of 1 |
| | 032-10-069 | Oxygen Bubble Tubing 1.8 metre | Box of 100 |
| | 032-10-067 | Oxygen Bubble Tubing (3mm) 30 metre coil, in dispensing box | Box of 1 |
| | 032-10-068 | Oxygen Bubble Tubing (3mm) 100 metre coil, in dispensing box | Box of 1 |
| | 038-01-226 | 22mm Corrugated Tubing with 45cm repeat, 50 metre coil in dispensing box | Box of 1 |
| | 038-01-228 | 22mm Corrugated Tubing with 15cm repeat, 50 metre coil in dispensing box | Box of 1 |
| | 038-01-230 | 22mm Corrugated Tubing. 2 metres long with two 22mm female connectors | Box of 20 |
| | 010-650 | Adult Self Sealing Water Trap | Box of 10 |
| | 020-650 | Paediatric Self Sealing Water Trap | Box of 10 |
| | 032-10-117 | Oxygen Tubing T Connector | Box of 25 |
| | 032-10-118 | Oxygen Tubing Right Angle Connector | Box of 25 |
|  | 032-10-119 | Oxygen Tubing Straight Connector | Box of 25 |
| | 032-10-110 | Oxygen Tubing Swivel Connector | Box of 25 |
| | 032-10-111 | Oxygen Tubing Swivel Connector with Clip | Box of 25 |

# Recommended for further reading

## Oxygen Therapy


1 Cox D. Gillbe (1982)
"Fixed Performance Oxygen Masks - Hypoxic Hazard of Low Capacity Designs."
Anaesthesia 36, 958-964

2 Campbell EJM (1960)
"A Method of controlled Oxygen Administration which Reduces the Risk of Carbon-Dioxide Retention." Lancet ii, 12

3 Leigh JM (1970)
"Variation in Performance of Oxygen Therapy Devices"
Anaesthesia 25, 210-220

4 Leigh JM
"General Anaesthesia vol. 1 4th Edition" (1980)
Ed. By Gray TC, Nunn JF and Utting JE Butterworth London
"Methods of Oxygen Therapy"

5 "Use and Dangers of Oxygen Therapy"(1960)
Scottish Home and Health Dept HMSO Edinburgh

6 Webber BA (1967)
"Humidification with Controlled Oxygen Therapy"
Physiotherapy Vol. 62 No.5

7 Jones H, Turner S, Hughes JMB (1984) "Performance of the Large-Reservoir Oxygen Mask (Ventimask)" Lancet, June 30th, 1427-1431

8 Crapo JD, Peters-Golden M, Marsh-Salin J. Pathologic changes in the lungs of oxygen-adapted rats: a morphometric analysis. Lab Invest
1978;39:640-653

9 Morgan JF, Robinson LA, Lowe JE, Wolfe WG. Effects of oxygen toxicity on regional ventilation and perfusion in the primate lung.
Surgery 1981;89:575-81

10 Havgaard N.
"Cellular mechanisms of oxygen Toxicity"
Phsyiol Rev
1968;48:311-73

11 Welch BE, Morgan TE Jr, Clamann MG
"Time-concentration effects in relation to oxygen toxicity in man"
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1963;22:1053-6

12 Stoller JK, Kacmarek RM
"Ventilatory strategies in the management of the adult respiratory distress syndrome"
Clin Chest Med
1990;11:755-72

13 Jamieson D, Chance B, Cadenas E, Boneris A
"The relation of free radical production to hyperoxia"
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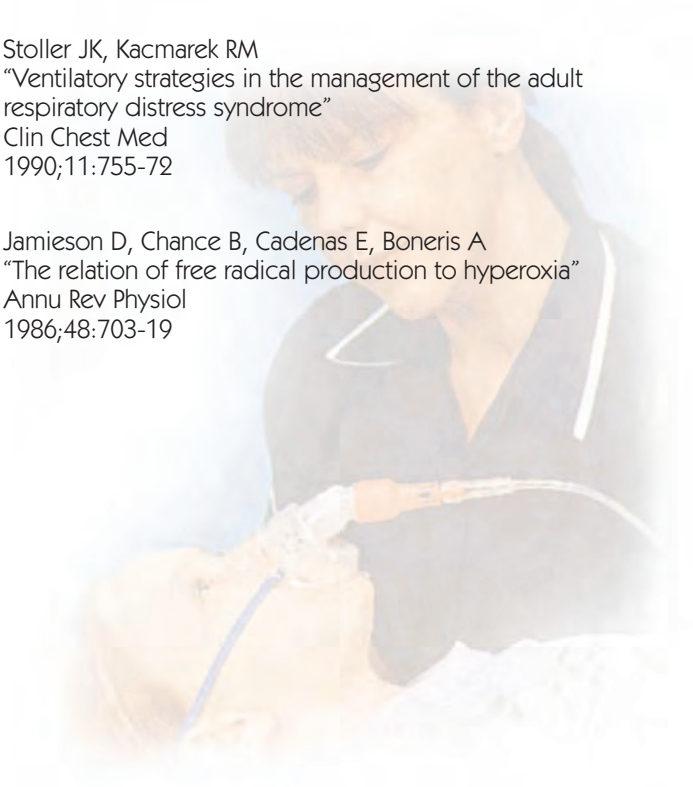

## Aerosol Therapy


1 Miller WC, Mason JW
"Small Volume Nebulisers Versus Metered Dose Inhalers"
Chaet
103:655

2 Dolovich M,e al
"Clinical Evaluation of a simple Demand Inhalation MDI Aerosol Delivery Devices"
Chest
84:34-41

3 Alberts WM
"Occupational Asthma in Respiratory Care Workers"
Resp Care
1993;38(9):977-1004

4 Morrow PE
"Aerosol Characterisation and deposition Am Respir Dis
1974:88-99

# Breathing System Products

# Breathing System Products


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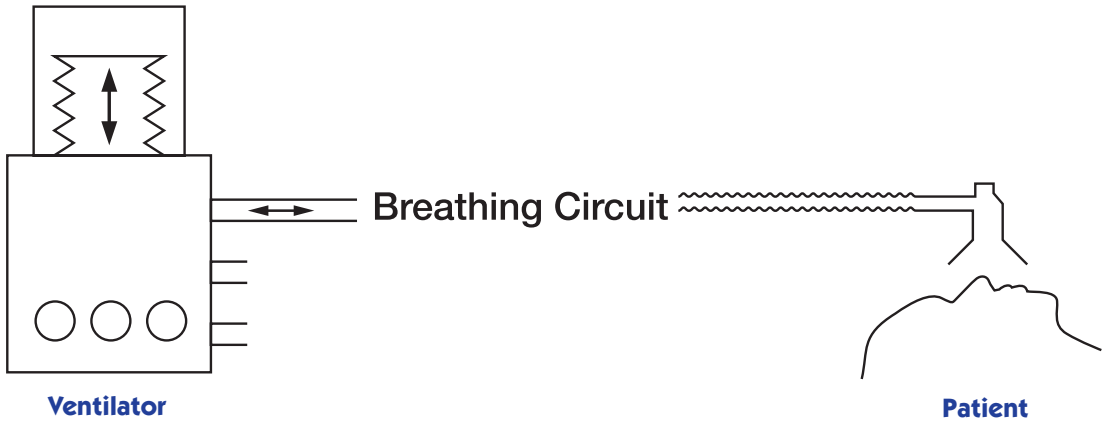
# Introduction

**General Anaesthesia** is usually obtained by a preliminary intravenous injection of a sleep inducing agent which will render the patient unconscious within a relatively short period of time, during which the patient will be induced using a gaseous mixture of Oxygen, Nitrous Oxide and an anaesthetic agent to maintain unconsciousness.

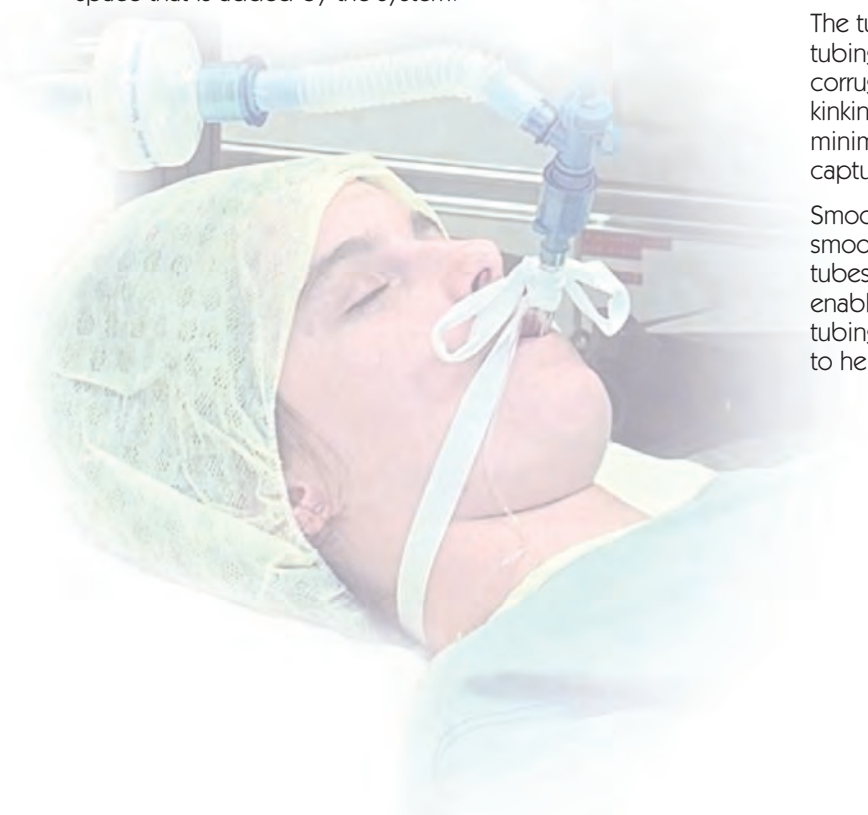
The anaesthetic breathing system is the device used in transporting the gases to and from the patient.




## Essential Requirements of a Breathing System

The most important criteria that a Breathing System must satisfy is that it delivers the intended inspired gaseous mixture from the machine to the alveoli. The fresh gas flow (FGF) rate required to prevent rebreathing of alveolar gas is a measure of the efficiency of a breathing system. It must also effectively dispose of exhaled waste gases.

Two other aspects that affect the patient directly is the amount of resistance there is within the system and the amount of dead space that is added by the system.



## Components of a Breathing System

There are several components used in the construction of an anaesthetic breathing system:

a) A fresh gas entry port in the form of a delivery tube.

b) APL Valve.

c) Reservoir Bag.

d) Carbon Dioxide Absorbent (only if used in rebreathing system).

The tubing used in the circuits are either made of corrugated tubing or smooth bore tubing. The design of Flexicare corrugated tubing is such that it aids in flexibility and prevents kinking and occlusion. The height of the corrugations are minimal so that there is minimum air disruption, and it also captures water vapour which occurs naturally during expiration.

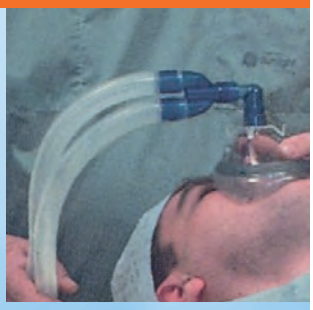
Smooth bore tubing is as its name suggests and is completely smooth on the inside. Some Anaesthetists argue that these tubes eliminate air turbulence and thus perform better – enabling lower FGF than with corrugated tubing. Smooth bore tubing has an integral spiral running the entire length of the tube to help reduce the risk of kinking and occlusion.

## Crush Resistant

22mm corrugated tube made of a flexible co-polymer providing an elasticity within the tube which will **resist crushing. Flow will be maintained even when twisted through 180°.**

The lightweight system **minimises 'Drag' and pressure** on the patient.

The shallow tube corrugations **minimise flow resistance and turbulence,** ensuring the required flow rate is maintained.

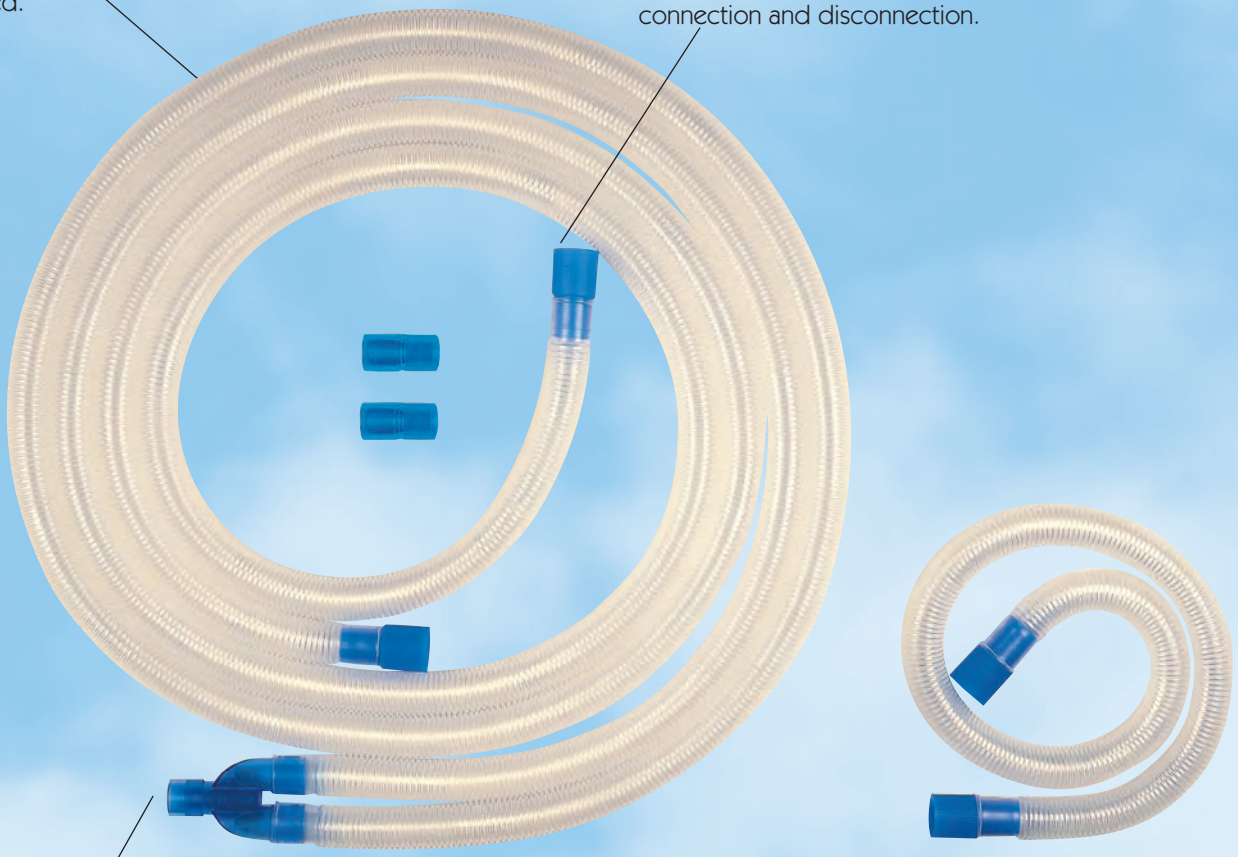


## Easy and secure fitting

22mmF Serrated Connectors providing a **secure fitting** to the machine.

Secure hand grip enabling **easy removal** from the machine.

Soft, lightweight and flexible material ensures **a secure seal** while still allowing ease of connection and disconnection.



## Easy to manage

The Parallel Y Piece allows for **greater control** of the System.

The double walled, 22mmM/15mmF patient end connection allows for **ease of fitting to** Catheter Mounts, Endotracheal Tubes, Laryngeal Masks, Face Masks or Elbows.

A Swivel Y Piece on selected circuits facilitates **the most convenient position during anaesthesia.**

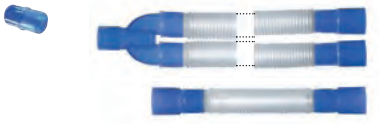
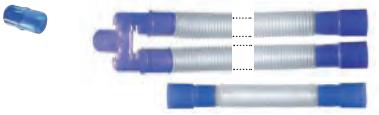
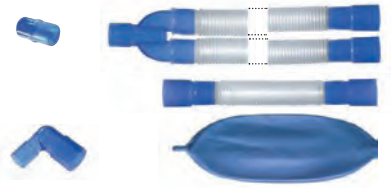
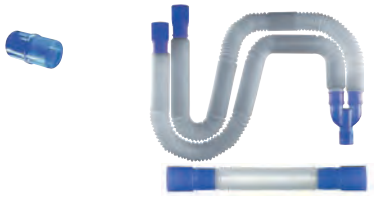
Improved design of the Y Piece provides for **optimum flow with minimal resistance.**

**A wide range of Venticaire Anaesthetic Breathing systems are offered to match your specific requirements.**

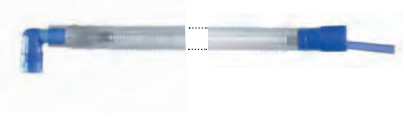
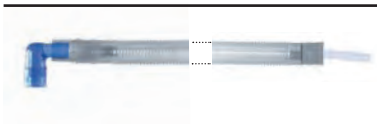
**All systems are supplied with one spare 22mm male connector, allowing for most connection configurations.**

# Anaesthetic Breathing Systems

## Adult Circular Systems

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 038-01-100<br>038-01-105 | Basic Parallel (1.6 Metre)<br>Basic Parallel (2.4 Metre)<br>22mm lightweight, extra flexible corrugated tube with parallel Y piece and 22mm F connectors + spare 22mm M connectors | 20<br>20 |
|  | 038-01-120<br>038-01-125 | Basic Parallel with Limb (1.6 Metre)<br>Basic Parallel with Limb (2.4 Metre)<br>22mm lightweight, extra flexible corrugated tube with parallel Y piece and 22mm F connectors +0.8m F/F Limb + spare 22mm M connectors | 20<br>20 |
| | 038-01-102<br>038-01-103 | Basic Parallel with Swivel Y (1.6 Metre)<br>Basic Parallel with Swivel Y (2.4 Metre)<br>22mm lightweight, extra flexible corrugated tube with Swivel Y piece and 22mm F connectors + spare 22mm M connectors | 20 |
|  | 038-01-122 | Basic Parallel with Swivel Y(1.6 Metre) +Limb<br>22mm lightweight, extra flexible corrugated tube with Swivel Y piece and 22mm F connectors + 0.8m F/F Limb + spare 22mm M connectors | 20 |
|  | 038-01-110 | Basic Parallel with Elbow (1.6 Metre) and 2L Reservoir Bag<br>22mm lightweight, extra flexible corrugated tube with parallel Y piece and 22mm F connectors + 0.8m F/F Limb + Low Profile Elbow + 2 litre Reservoir Bag + spare 22mm M connectors. | 20 |
|  | 038-01-106 | Flexi-Lock Parallel<br>Flexible expandable tube with clear parallel Y piece and 22mm F connectors + 0.8m F/F Limb + spare 22mm M connectors | 20 |

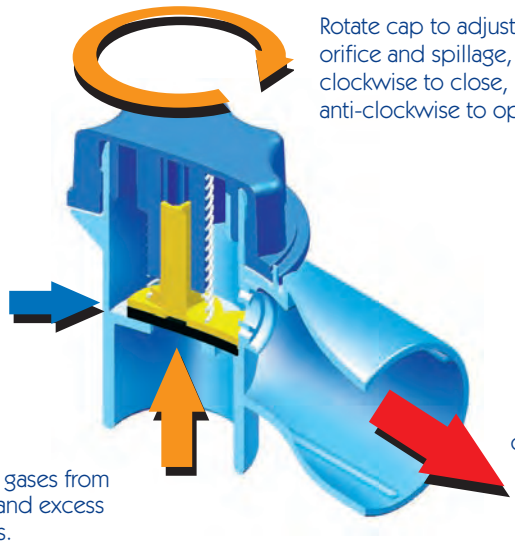
## Adult Bain Systems

| | | | |
|---|---|---|---|
|  | 038-01-200<br>038-01-210 | Basic Bain Coaxial System (1.6 Metre)<br>Basic Bain Coaxial System (2.4 Metre)<br>22mm lightweight, flexible corrugated tube with 22mm M swivel connector and Low Profile Elbow | 20<br>20 |
|  | 038-01-201 | Basic Bain Coaxial System (1.6 Metre)<br>22mm lightweight, low compliance corrugated tube with 22mm M swivel connector and Low Profile Elbow | 20 |

# Venticaire® APL Function

**The function of APL valve is to allow expired and excess fresh gas to escape (spill) from a breathing system without allowing entry of the outside air into the breathing system even during inspiration.**

The Venticaire® Adjustable Pressure Limiting valve is of a variable orifice design. The unique design of the Venticaire valve allows adjustment of the escape of expiratory and excess fresh gas as required in order to maintain a constant pressure in the breathing system. As soon as the pressure inside the breathing system increases above 60cm of $H_2O$ in the adult valve and 35cm $H_2O$ in the paediatric valve, the stem of the valve is pushed up, allowing spillage of excess gas. As soon as the pressure drops below the values mentioned above, the spring will push the stem back to its pre-set position. This will maintain the pressure within the breathing system at a constant level.

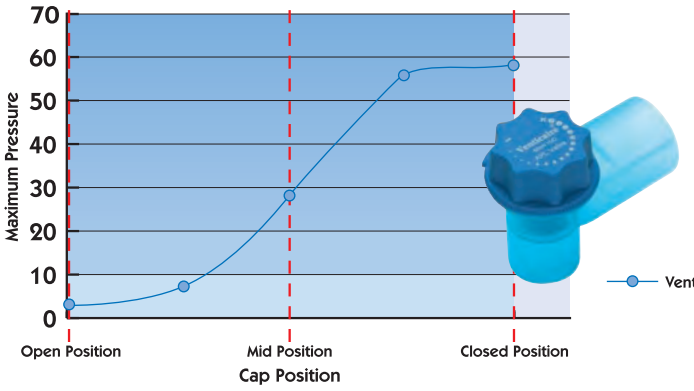

Rotate cap to adjust orifice and spillage, clockwise to close, anti-clockwise to open.
Variable orifice stem supported by spring, opens when the pressure in the system increases.
Exhaust gases out to scavenging system via 30mm male port. 30/22mm scavenging connector available in the product range.
Exhaled gases from patient and excess fresh gas.

The simple mechanism of the Venticaire® Adjustable Pressure Limiting valve produces a linear performance and protects against over inflation of the reservoir bag. This permits a minimal resistance to expiration so preventing pneumothorax or trauma to the airways.

## Venticaire APL Valve

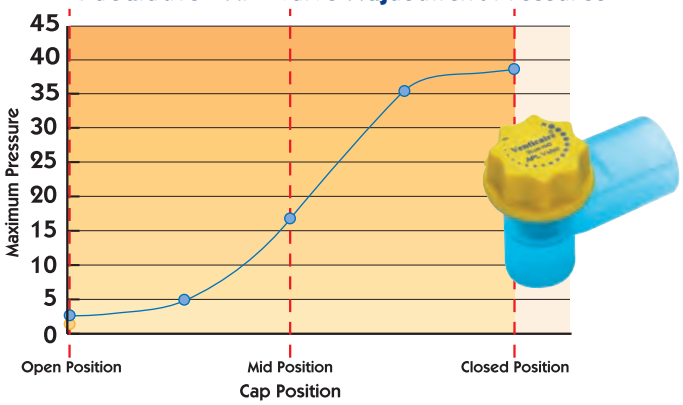
To set the valve initially, test the valve in the open position to check for flow and then test the valve in the closed position to ensure correct function. In use, depending on the fresh gas flow and the type of breathing system, you adjust the valve by turning the cap to a position that permits the rebreathing bag to inflate and deflate with breathing, without allowing over inflation or collapse of the reservoir bag.

### Adult - APL Valve Adjustment Pressures




| Valve | Cap position (degrees) | | | | |
|---|---|---|---|---|---|
| | 0 (open) | 90 | 180 | 270 | 360 (closed) |
| $H_2O$ cm | 3 | 7 | 28 | 55 | 60 |

### Paediatric - APL Valve Adjustment Pressures




| Valve | Cap position (degrees) | | | | |
|---|---|---|---|---|---|
| | 0 (open) | 90 | 180 | 270 | 360 (closed) |
| $H_2O$ cm | 2.5 | 5 | 16 | 31 | 35 |

**Pressure Adjustment with Cap Rotation**

The Adult and Paediatric APL valves were tested for their maximum pressures whilst varying the cap position from open to closed at 15 l/min.

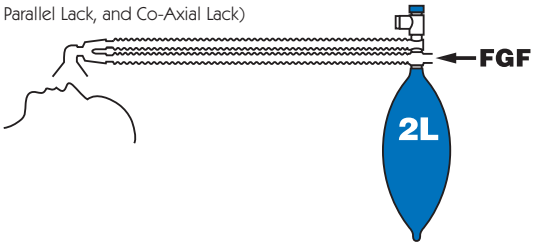
The results show that the 'Variable Orifice' design of the Venticaire Adult and Paediatric APL valves offer the clinician a wide range of pressures. The mechanism of the valve also allows for very fine control of these pressures.

**The unique variable orifice design of the Venticaire® APL Valve produces a linear performance.**

# Mapleson Classification

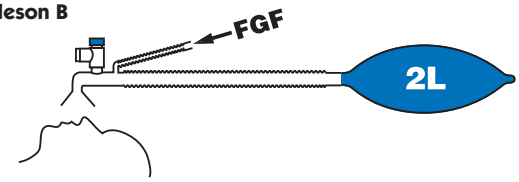
**In general anaesthesia, recovery and emergency resuscitation procedures involve the use of a breathing system. The principle of anaesthetic systems is to efficiently eliminate exhaled carbon dioxide, without greatly increasing dead space or resistance. In 1954 Mapleson classified breathing systems based on their efficiency in eliminating carbon dioxide during spontaneous respiration. The breathing systems are classified in order of increased requirement of fresh gas flow (FGF) to prevent rebreathing during spontaneous respiration. System A requires 0.8 - 1 times, B and C require 1.5-2 times and D, E and F require 2-4 times of the patient's minute volume.**

**Mapleson A**
(Magill, Parallel Lack, and Co-Axial Lack)



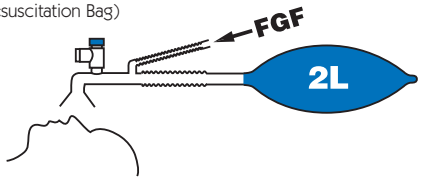

This system consists of a reservoir bag close to the fresh gas outlet with the APL valve placed at the patient end (Magill A, or expiratory limb - Parallel Lack). During inspiration, as the patient's inspiratory flow is greater than the Fresh Gas Flow, additional gases will be drawn out from the reservoir bag. During the expiratory phase, exhaled gases will force the fresh gas back into the circuit and reservoir bag. This will result in increasing the pressure in the breathing system and thus forcing the exhaled gases to escape through the APL valve (scavenging port). The system requires a low flow (0.8 - 1 times of Minute Volume, approximately 6 - 8 litres / minute) during spontaneous respiration to prevent rebreathing. This system is not recommended for intermittent positive pressure ventilation. (IPPV)

**Mapleson B**



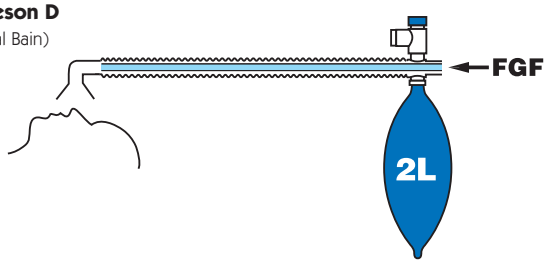

In this system the Reservoir bag, fresh gas supply and APL valve are closer to the patient. This will cause mixing of inspiratory and expiratory gases and therefore a higher flow rate (1.5 - 2 times of the patient's minute volume, i.e. 12 - 16 litres/min) is required to prevent rebreathing during spontaneous respiration. Due to the risk of rebreathing and reduced delivery of oxygen rich gases to the patient this system is no longer used.

**Mapleson C**
(Waters Bag, Bagging System (Adult, Direct and Paediatric) and Resuscitation Bag)



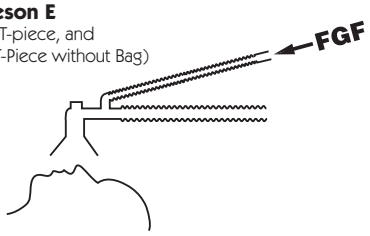

This system is similar to Mapleson B, however, the bag is positioned very close to the patient. This system is used for manual ventilation during resuscitation. A flow rate of 1.5 - 2 times of the Minute Volume is required to avoid rebreathing.

**Mapleson D**
(Coaxial Bain)



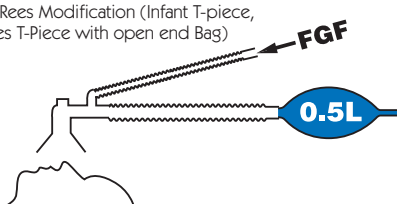

This system is mainly used with spontaneous respiration. The Fresh Gas Flow is close to the patient and the APL valve is placed away from the patient. The risk of rebreathing in this circuit will be high especially in patients who have a short expiratory pause or do not have an expiratory pause (infants). To overcome this problem a high FGF of 2 - 4 times of the patient's Minute Volume is required. If Mapleson D is used with controlled or assisted ventilation a high FGF is required to prevent **all** rebreathing. In practice some rebreathing is tolerated and in an adult an FGF of 6 - 7 litres/minute will maintain a normal arterial $CO_2$ tension.

**Mapleson E**
(Infant T-piece, and Ayres T-Piece without Bag)



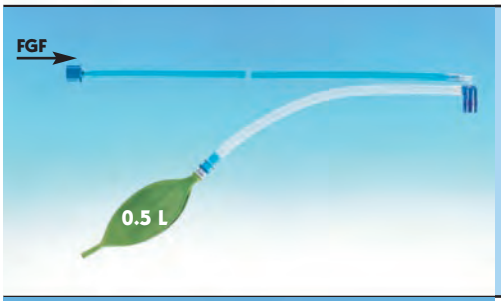
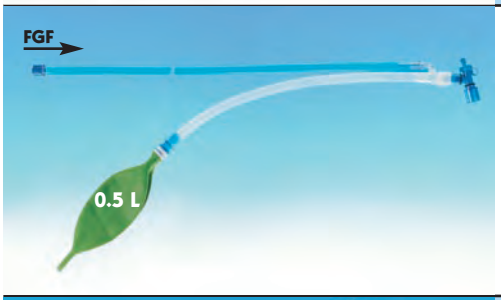
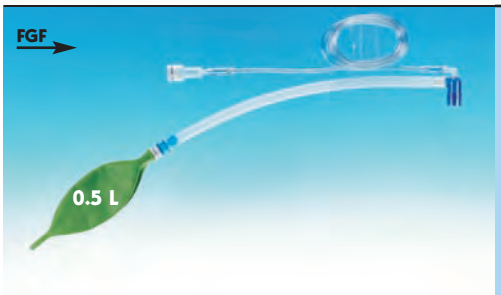

This system is primarily for use in neonates and paediatrics, where low resistance is of great importance. There is no APL valve (to reduce resistance) and a high FGF, 2 - 4 times of the patient's Minute Volume (with a minimum flow of 3 litres/minutes) is required to eliminate rebreathing risk during spontaneous ventilation. This system is recommended for up to 22kg (approximate tidal volume of 140ml).

**Mapleson F**
Jackson Rees Modification (Infant T-piece, and Ayres T-Piece with open end Bag)

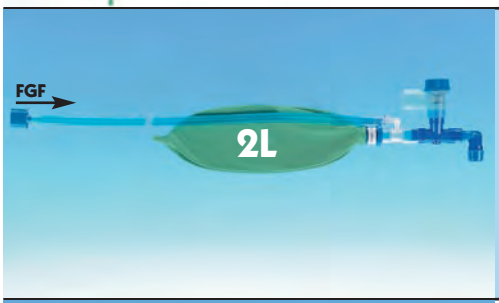
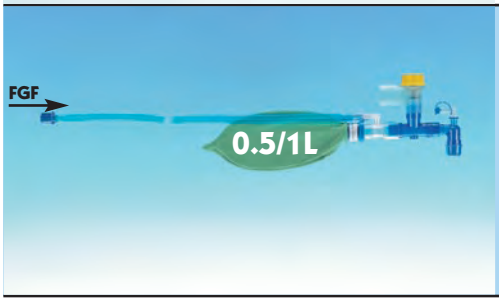



Jackson Rees made a great improvement to T-Pieces (Mapleson E) by adding an open tail 0.5 litre reservoir bag to the end of expiratory (reservoir) limb. This allows manual ventilation and the application of Positive End Expiratory Pressure (PEEP) to help maintain open airways. For controlled ventilation, normocapnia can be maintained with a FGF of 1000ml + 100ml/kg body weight.

# APL Breathing Systems

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 038-02-273 | Ayres T-Piece (Mapleson F) with Paediatric APL Valve<br>1.6 metre, 10mm corrugated tube fresh gas line with 0.5 Litre closed tail Reservoir Bag and Paediatric APL Valve | 20 |
|  | 038-02-191 | Infant T-Piece (Mapleson F)<br>1.6 metre, 10mm corrugated tube fresh gas line with 15mm male connector and spare 22mm female adapter, with 0.5 Litre open tail Reservoir Bag | 20 |
|  | 038-02-196 | Ayres T-Piece (Mapleson F)<br>1.6 metre, 10mm corrugated tube fresh gas line with 15mm male connector and spare 22mm female adapter, with 0.5 Litre open tail Reservoir Bag and Double Swivel Elbow with Elastomeric Suction cap | 20 |
|  | 038-02-190 | Infant T-Piece (Mapleson F)<br>2.1 metre Star Lumen tube (fresh gas line) with 22mm connector, with 0.5 Litre open tail Reservoir Bag | 20 |
| | 038-02-195 | Ayres T-Piece (Mapleson F)<br>2.1 metre Star Lumen tube (fresh gas line) with 22mm connector, with 0.5 Litre open tail Reservoir Bag and Double Swivel Elbow with Elastomeric Suction cap | 20 |
| | 038-02-198 | Ayres T-Piece (Mapleson F)<br>2.1 metre Star Lumen tube (fresh gas line) with 22mm connector, with 1.0 Litre T-Tap vented Reservoir Bag and Double Swivel Elbow with Elastomeric Suction cap | 20 |

# APL Product List

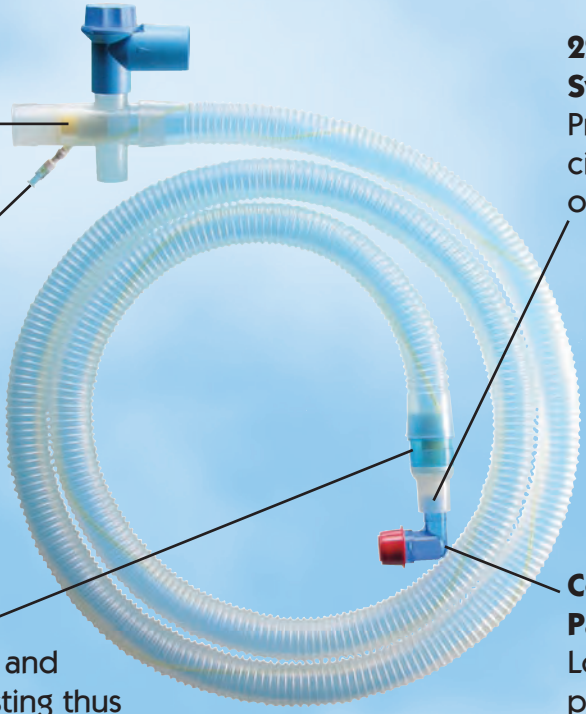
| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | | Bain System (Mapleson D) | |
| | 038-01-251 | 1.6 metre, 2 Litre Reservoir Bag and Adult APL Valve | 20 |
| | 038-01-253 | 2.4 metre, 2 Litre Reservoir Bag and Adult APL Valve | 20 |
| | 038-01-254 | 5.4 metre, 2 Litre Reservoir Bag and Adult APL Valve | 10 |
| | | Magill System (Mapleson A) | |
| | 038-01-256 | 22mm corrugated 1.6 metre long fresh gas tube, with 2 Litre Reservoir Bag and Adult APL Valve | 20 |
| | | Parallel Lack (Mapleson A) | |
| | 038-01-257 | 22mm corrugated 1.6 metre long fresh gas tube, with 2 Litre Reservoir Bag | 20 |
|  | | Adult Bagging System (Mapleson C) | |
| | 038-01-255 | 10mm corrugated 1.6 metre long fresh gas tube with 2 Litre Reservoir Bag and Adult APL Valve | 20 |
| | 038-01-258 | 2.1 metre star lumen tubing with 2 Litre Reservoir Bag and Adult APL Valve | 20 |
| | | Direct System (Mapleson C) | |
| | 038-02-270 | 10mm corrugated 1.6 metre fresh gas tube with 1 Litre Reservoir Bag and Paediatric APL Valve | 20 |
|  | | Paediatric Bagging System (Mapleson C) | |
| | 038-02-271 | 10mm corrugated 1.6 metre fresh gas tube with 0.5 Litre Reservoir Bag and Paediatric APL | 20 |
| | 038-02-272 | 10mm corrugated 1.6 metre fresh gas tube with 1 Litre Reservoir Bag and Paediatric APL | 20 |

## VentiFlow Co-Axial Breathing Systems
## The Innovative Solution for Open and Closed Systems

**Coloured Connectors**
Allows for visual inspection of the inner tube and connection integrity.

**Integrated Monitoring Port**
The machine end luer lock port allows for secure connection and its integrated construction maintains the patency of the monitoring line and reduces the risk of kinking.

**Swivel Inner Connectors**
Reduce the risk of the tubes and the monitoring line from twisting thus reducing potential patient drag and the risk of disconnection.



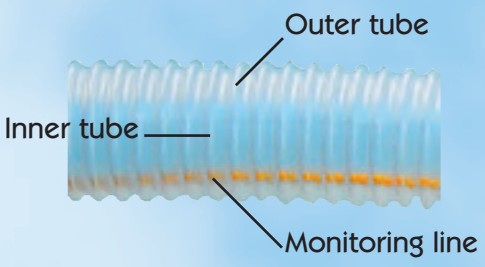
**22mm Patient End Swivel Connector**
Provides flexibility of the circuit and reduces drag on the patient end devices.

**Centrally Positioned Patient End Monitoring Port**
Located in the centre of the patient end connector allows for a more accurate sampling of $CO_2$.

The VentiFlow Breathing System can be used as an open or closed system providing maximum flexibility for use in both Intensive Care and Anaesthetic procedures.

Its construction makes Ventiflow ideal for Low Flow Anaesthesia. Low Flow Anaesthesia provides significant cost savings in reducing the amount of anaesthetic agents used during the induction and maintenance period of the patient as well as enabling the gases to be flushed out more rapidly in the recovery room and bringing the patient to consciousness quickly and safely.

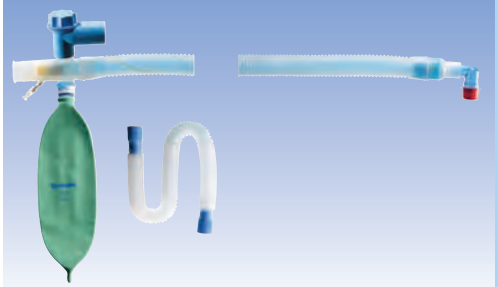
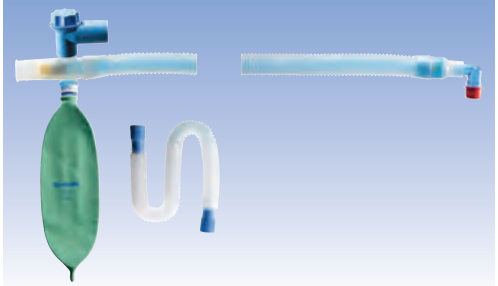
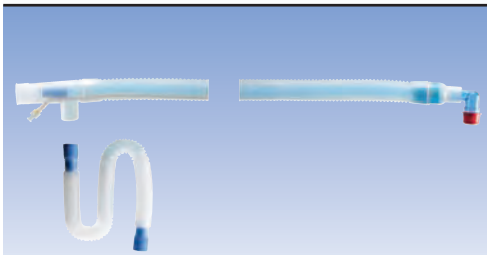
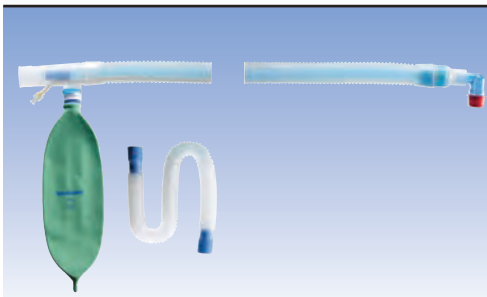
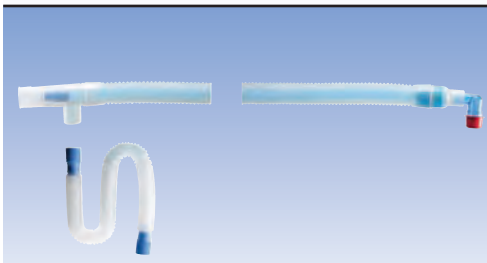
Flexicare's disposable Adjustable Pressure Limiting Valve (APL) is of a variable orifice design providing linear performance. The valve can be set at different levels to allow for spillage and will open at 60cm/$H_2O$ (adult). APL Valve gives complete confidence in inducing patients and during maintenance for anaesthesia.




The 30 mm expiratory limb warms the inspiratory limb gases that are delivered to the patient. The diameter of the tube reduces resistance to flow ensuring effective administration at low flow, making this circuit ideal for both spontaneously breathing and ventilated patients.

# Ventiflow™

**is available in 10 variations with and without APL Valve and a choice of with and without monitoring lines**

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
|  | 038-01-530 | Ventiflow Max 1.6m<br>1.6m breathing system with APL Valve, 2L Reservoir Bag, Monitoring Line and FlexiLock expandable limb | 20 |
| | 038-01-535 | Ventiflow Max 2.4m<br>2.4m breathing system with APL Valve, 2L Reservoir Bag, Monitoring Line and FlexiLock expandable limb | 20 |
|  | 038-01-520 | Ventiflow Plus 1.6m<br>1.6m breathing system with APL Valve, 2L Reservoir Bag, and FlexiLock expandable limb | 20 |
| | 038-01-525 | Ventiflow Plus 2.4m<br>2.4m breathing system with APL Valve, 2L Reservoir Bag, and FlexiLock expandable limb | 20 |
|  | 038-01-510 | Ventiflow Standard 1.6m<br>1.6m breathing system with Monitoring Line and FlexiLock expandable limb | 20 |
| | 038-01-515 | Ventiflow Standard 2.4m<br>2.4m breathing system with Monitoring Line and FlexiLock expandable limb | 20 |
|  | 038-01-501 | Ventiflow Basic 1.6m<br>1.6m breathing system, Reservoir Bag and FlexiLock expandable limb | 20 |
| | 038-01-506 | Ventiflow Basic 2.4m<br>2.4m breathing system, Reservoir Bag and FlexiLock expandable limb | 20 |
|  | 038-01-500 | Ventiflow 1.6m<br>1.6m breathing system, and FlexiLock expandable limb | 20 |
| | 038-01-505 | Ventiflow 2.4m<br>2.4m breathing system, and FlexiLock expandable limb | 20 |

# Smooth Bore Circuits

## Kink Resistant

The spiral outer casing of the Smooth Bore tubing is designed to maintain the patency of the inner lumen, ensuring flow of fresh gas.

## Easy and secure fitting

22mmF flexible Connectors providing a **secure fitting** to the machine.

## Flexible Connectors

22mmF Flexible Connectors provide a positive secure fit to the ventilator.

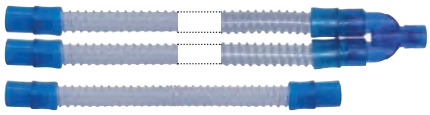
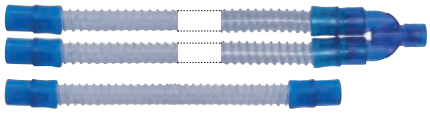
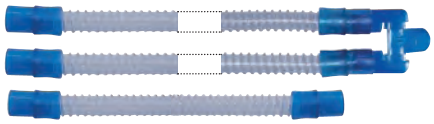
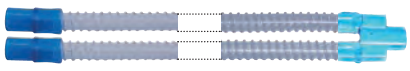
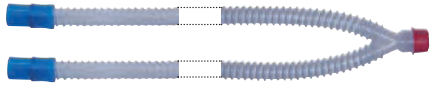
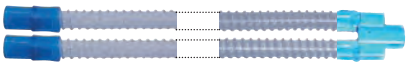
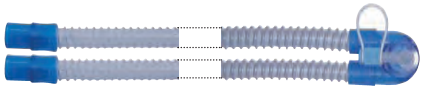
**Flexicare can produce a wide range of Custom Smooth Bore Circuits to meet specific requirements.**

# Smooth Bore Circuits

The diagram shows the composition of the smooth bore tubing with the smooth inner lumen surrounded by the kink resistant spiral bound casing, with an additional protective outer.

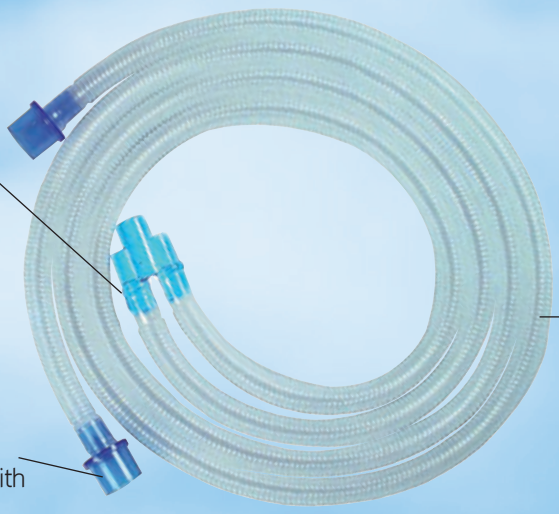
The smooth bore tube allows flow of the gases with less resistance and reduced turbulence that can be associated with some corrugated tubing circuits.

## Anaesthetic Breathing Systems

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 038-01-104<br>038-01-107 | Adult Smooth Bore Circuit (1.6 Metre)<br>Adult Smooth Bore Circuit (2.4 Metre)<br>22mm lightweight smooth bore tubing with parallel Y piece and flexible 22mm F connectors | 20<br>20 |
|  | 038-01-124<br>038-01-127 | Adult Smooth Bore Circuit (1.6 Metre)<br>Adult Smooth Bore Circuit (2.4 Metre)<br>22mm lightweight smooth bore tubing with parallel Y piece and flexible 22mm F connectors + 0.8m F/F Limb | 20<br>20 |
| | 038-01-108<br>038-01-109 | Adult Smooth Bore Circuit (1.6 Metre)<br>Adult Smooth Bore Circuit (2.4 Metre)<br>22mm lightweight smooth bore tubing with detachable parallel Y piece and flexible 22mm F connectors | 20<br>20 |
|  | 038-01-128<br>038-01-129 | Adult Smooth Bore Circuit (1.6 Metre)<br>Adult Smooth Bore Circuit (2.4 Metre)<br>22mm lightweight smooth bore tubing with detachable parallel Y piece and flexible 22mm F connectors + 0.8m F/F Limb | 20<br>20 |
|  | 038-01-123 | Adult Smooth Bore Circuit (1.6 Metre)<br>22mm lightweight smooth bore tubing with detachable swivel parallel Y piece and flexible 22mm F connectors + 0.8m F/F Limb | 20 |
|  | 038-02-166 | Paediatric Smooth Bore Circuit (1.5 Metre)<br>15mm lightweight smooth bore tubing with parallel Y piece and flexible 22mm F connectors | 20 |
|  | 038-02-162 | Paediatric Smooth Bore Circuit (1.5 Metre)<br>15mm lightweight smooth bore tubing with Y piece and flexible 22mm F connectors | 20 |
|  | 038-02-163 | Paediatric Smooth Bore Circuit (1.5 Metre)<br>15mm lightweight smooth bore tubing with detachable Y piece and flexible 22mm F connectors | 20 |
|  | 038-02-164 | Paediatric Smooth Bore Circuit (1.5 Metre)<br>15mm lightweight smooth bore tubing with Low Dead Space Y piece + CO2 monitoring ports and flexible 22mm F connectors | 20 |

# Paediatric Breathing Circuits

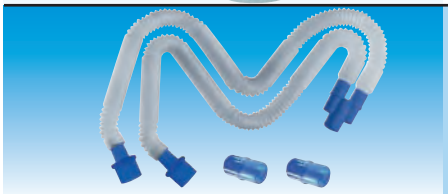
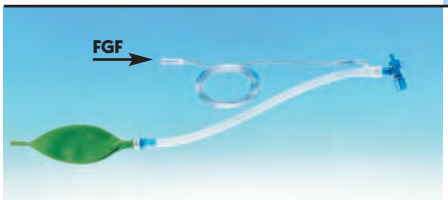
**15mm Y Piece**
Allows for connection to all 15mm standard compliant connectors.



**Crush Resistant**
Made from 15mm corrugated tubing to the same high specification as the Venticaire Anaesthetic and ITU Circuits.

**22mm F connectors with 2 spare 22mm M/M** connectors supplied with each circuit.

## Paediatric Systems

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 038-02-165 | Basic Parallel (1.5metre)<br>Low resistance 15mm corrugated tube, Parallel Y piece, 22mm F connectors + 2 spare 22mm M connectors. | 20 |
|  | 038-02-180 | Flexi-Lock Parallel<br>15mm expandable up to 1.8metres corrugated tube, with Parallel Y piece, 22mm F connectors, + 2 spare 22mm M connectors | 20 |
| | 038-02-190 | Infant T-Piece<br>2.1metre crush resistant gas line with 22mm F connector, 0.45metre corrugated 15mm tube and 0.5 litre open tail Reservoir Bag | 20 |
| | 038-02-191 | Infant T-Piece (Mapleson F)<br>1.6metre, 10mm corrugated tube fresh gas line with 15mm male connector and spare 22mm female adapter, with 0.5 Litre open tail Reservoir Bag | 20 |
|  | 038-02-195 | Ayres T-Piece<br>2.1metre crush resistant gas line with 22mm F connector, 0.45metre corrugated 15mm tube, 0.5 litre open tail Reservoir Bag and Double Swivel Elbow with elastomeric cap. | 20 |
| | 038-02-196 | Ayres T-Piece (Mapleson F)<br>1.6 metre, 10mm corrugated tube fresh gas line with 15mm male connector and spare 22mm female adapter, with 0.5 Litre open tail Reservoir Bag and Double Swivel Elbow with Elastomeric Suction cap | 20 |

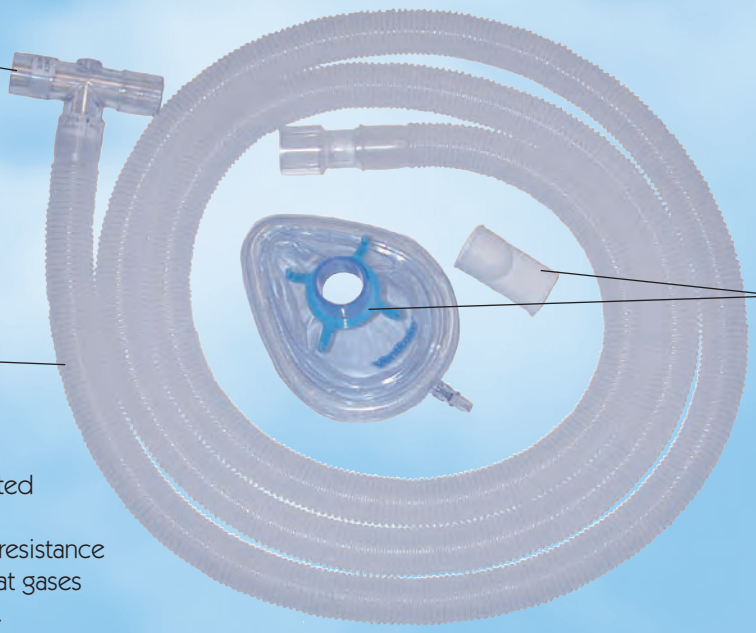
# Entonox Circuits

**Entonox T-Piece**

The T-Piece incorporates 2 non-return valves to allow for inspired gases to be delivered through the system and preventing expired gases re-entering the circuit.

**Lightweight**

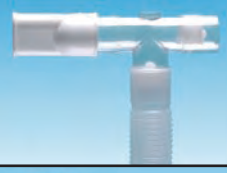
22mm corrugated tube will retain its shape and resist crushing. Flow is still maintained even when twisted through 180°. The shallow corrugations minimise flow resistance and turbulence, ensuring that gases reach the expectant patient.



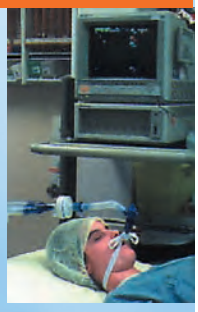
**Patient Choice**

The entonox circuits are available for use with a mouthpiece or mask, providing patient choice.

## Entonox Systems

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
|  | 038-01-176 | Entonox Circuit with Mouthpiece | 20 |
| | 038-01-177 | Entonox Circuit with Mask | 20 |
| | 038-01-178 | Entonox Circuit with Mouthpiece and Mask | 20 |
| | 032-10-066 | Entonox Mouthpiece | 50 |
| | 038-41-369 | BV Filter and HME and Mouthpiece for Entonox | 50 |

# ITU Breathing Systems



## Low Compliance with reduced pressure and drag on the patient

Low Compliance Ventilator Tubes are made with a high density flexible co-polymer **providing compliance to a level which is required for use in ventilated patients.**

## Heated Wires

Each Heated Wire System is tested to ensure it meets the required resistance level.

Compatible with most commonly used humidifiers and ventilators complying with the required standards.

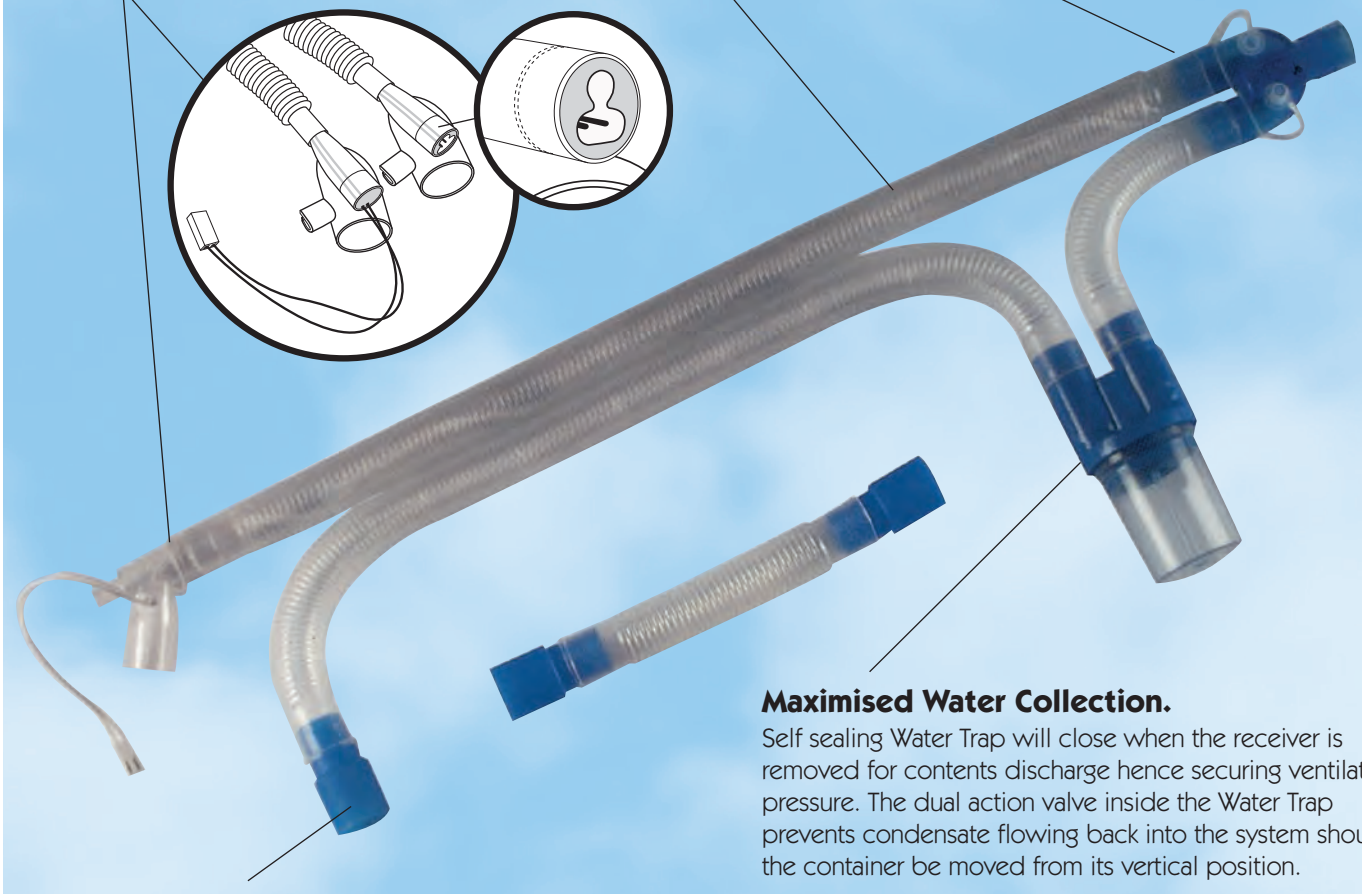
## Easy to manage

The Parallel Y Piece allows for a **greater control** of the system.

The Double Walled, 22mmM/15mm F patient end connection allows **for ease of fitting** to Catheter Mounts, Endotracheal Tubes, Laryngeal Masks, Face Masks or Elbows.

The Frosted Connection check marks on the connector on the patient side of the Y Piece **allows visual inspection confirming secure attachment.**

Ports for temperature and pressure monitoring.



## Maximised Water Collection.

Self sealing Water Trap will close when the receiver is removed for contents discharge hence securing ventilation pressure. The dual action valve inside the Water Trap prevents condensate flowing back into the system should the container be moved from its vertical position.

Vertical inlet ports enhance gravity induced flow of condensate,**maximising water collection from the circuit.**

## Easy and secure fitting

22mmF Serrated Connectors providing a **secure fitting** to the machine.

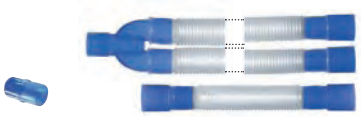
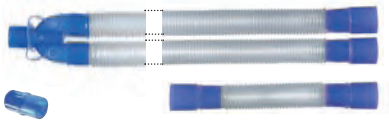
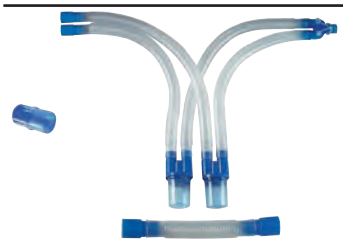
Secure hand grip enabling **easy removal** from the machine

Soft, lightweight and flexible material ensures **a secure seal** while still allowing ease of connection and disconnection.

**A wide range of ITU Breathing Systems are offered to match your individual requirements.**

# ITU Breathing Systems

## Adult Ventilator Systems

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 038-01-130<br>038-01-132 | Standard Ventilator Breathing System(1.6 Metre)<br>Standard Ventilator Breathing System(2.4 Metre)<br>22 mm lightweight low compliance corrugated tube with parallel Y piece and 22mm F connectors + spare 22mm M connectors | 20<br>20 |
|  | 038-01-135 | Standard Ventilator Breathing System with Limb (1.6 Metre) 22mm lightweight low compliance corrugated tube with parallel Y piece and 22m F connectors + 0.8m F/F Limb + spare 22mm M connectors. | 20 |
|  | 038-01-140 | Ventilator Breathing System with Monitoring Ports ( 1.6 Metre) 22mm lightweight low compliance corrugated tube with parallel Y piece with 2 monitoring ports, 22mm F connectors + 0.8m F/F Limb + spare 22mm M connectors | 20 |
| | 038-01-150 | Ventilator Breathing System with Monitoring Ports and one Water Trap (1.6 Metre) 22mm lightweight, low compliance corrugated tube with parallel Y piece with 2 monitoring ports, 22mm F connectors, one self sealing water trap + 0.8m F/F Limb + spare 22mm M connectors | 20 |
|  | 038-01-155 | Ventilator Breathing System with Monitoring Ports and two Water Traps (1.6 Metre) 22mm lightweight, low compliance corrugated tube with parallel Y piece with 2 monitoring ports, 22mm F connectors and two self sealing water traps + 0.8m F/F Limb + spare 22mm M connectors | 20 |
| | 038-01-160<br><br>038-01-163 | Heated Wire Breathing System with Water Trap and Monitoring Ports (1.6 Metre) 22mm lightweight, low compliance, heat resistant corrugated tube with parallel Y piece, two monitoring ports, 22mm F connectors, self sealing Water Trap + 0.8 m F/F Limb + spare 22mm M connectors<br>As above with Cloverleaf end connector | 20<br><br>20 |
| | 038-01-161<br><br>038-01-164 | Dual Heated Wire Breathing System (1.6 Metre) with Y piece and Monitoring Ports<br>As above with Cloverleaf end connector | 20<br><br>20 |

# Principles of Humidity

Inspired gas is normally warmed, filtered and moistened during its passage through the upper airways, a process which is prevented by endotracheal intubation and tracheostomy exposing the lungs and airways to dry cold gas giving rise to a number of adverse effects including;

- **An increase in mucus viscosity**
- **Depressed ciliary activity**
- **Obstruction of the airways by tenacious secretions**

Artificial humidification of inspired gases is therefore essential when the upper respiratory tract is bypassed.

# The Venticaire® Humidification Chamber

All Chambers have **Integrated Water Feed Sets** with Universal Connectors. Maximum & Minimum Water Level Indicators

**Compatible with all Circuits** using 22mm connectors

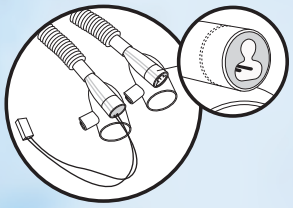
**Constant Monitoring of Water** Clear Chamber

**Effective Heat Transfer** from Aluminium Base

**Temperature Probe Port** with attached Security Plug

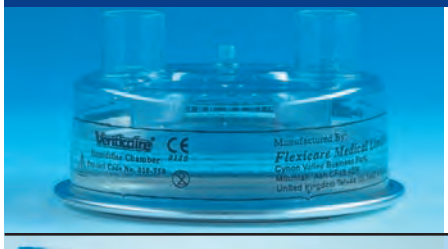
**Impact Resistant** Durable construction

220mL Capacity



Available with clover leaf connector

## Venticaire ITU & Humidification Systems

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
|  | 038-31-750 | Venticaire® Humidification Chamber | 20 |
| | 038-31-755 | Ventilator Breathing System (1.6m) with 'Y' Piece, Monitoring Ports, Water Trap & Venticaire® Humidification Chamber | 10 |
| | 038-31-760 | Ventilator Breathing System (1.6m) with 'Y' Piece, Monitoring Ports, Two Water Traps & Venticaire® Humidification Chamber | 10 |
| | 038-31-765 | Heated Wire Ventilator Breathing System (1.6m) with 'Y' Piece Monitoring Ports, Water Trap & Venticaire® Humidification Chamber | 10 |
| | 038-31-766 | As above with Cloverleaf end connector | 10 |
| | 038-32-765 | Paediatric Heated Wire Breathing System with 'Y' Piece Monitoring Ports, Water Trap & Venticaire® Humidification Chamber | 10 |
| | 038-32-766 | As above with Cloverleaf end connector | 10 |
| | 038-31-745 | Dual Heated Wire Breathing System (1.6m) with 'Y' Piece, Monitoring Ports & Venticaire® Humidification Chamber | 10 |
| | 038-31-746 | As above with Cloverleaf end connector | 10 |

**For total airway management with confidence**

# Recommended for further reading


**1** Moritz AR. Weisger JR.
Effects of cold air on the air passages and lungs.
Arch Intern Med 1945; 75:233-240

**2** Eager EI., Ethans, C.T.
The effects of inflow, overflow and valve placement on economy of circle system.
Anesthesiology, 1968, 29, 93-100.

**3** Benson RD.
Humidification of inspired gases during mechanical ventilation.
1991; 3:55-66

**4** M.C Blunt & K.R.
Burchett Editorial 1: Variant Creutzfeldt-Jakob Disease and disposable anaesthetic equipment - balancing the risks.
Br. J Anaesth., Jan 1, 2003;90(1):1-3

**5** Chiaranda M, Verona L, Pinamonti O, et al.
Use of heat and moisture exchanging (HME) filters in mechanically ventilated ICU patients; influence on airway flow-resistance. Intensive Care Med 1993; 19:462-6

**6** Miller DM.
Breathing systems reclassified.
Anaesthesia and intensive care 1995; 23: 281-83.

**7** Conway, C.M.
Anaesthetic breathing systems.
British Journal of Anaesthesia. 1985, 57, 649-57.

**8** Miller, D.M.
Breathing systems for use in anaesthesia. Evaluation using a physical lung model and classification.
British Journal of Anaesthesia. 1988, 60, 555-64.

**9** Miller DM.
Palm A. Comparison in spontaneous ventilation of the Maxima with the Humphrey ADE breathing system and between four methods for detecting rebreathing.
Anaesthesia and intensive care 1995; 23: 296-01.

**10** Meakin G, Jennings AD, Beatty PCW, Healy TEJ.
Fresh gas requirements of an enclosed afferent reservoir breathing system during controlled ventilation in children.
British Journal of Anaesthesia 1992; 68: 43-47.

**11** Beatty PCW, Meakin G, Healy TEJ.
Fractional delivery of fresh gas: a new index of the efficiency of semiclosed breathing systems.
British Journal of Anaesthesia 1992; 68: 474-77.


## Notes

# Breathing Filters & HMEF's

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# Introduction

## Filtration

Since 1965 an awareness as to contaminated ventilating machines causing infections to subsequent patients has resulted in a universal acceptance to use filters to protect the patient, staff and machinery. Filters and Heat Moisture Exchangers (HME) have developed since then not only to prevent bacterial and viral contamination but to also compensate for bypassing the upper airway during anaesthesia or intubation.

The blood born virus advisory panel of the Association of Anaesthetists of Great Britain and Ireland recommended that an appropriate filter should be placed between the patient and the breathing system, with a new filter being used for each patient.

This protection may be achieved by two different filtration methods, either by mechanical filtration, or by electrostatic charge filtration.

Mechanical filters, also known as pleated paper filters, have a tightly packed medium with a hydrophobic coating providing a small pore size membrane that physically stops the passage of organisms. Typically these filters have very high levels of efficiency and their hydrophobic properties also provide a degree of humidification for the patient.

Electrostatic filters use a medium that is loosely woven and given a charge the holds onto micro-organisms allowing filtration in a small, light casing.

## Filtration Principles

The primary objective of breathing filters is to stop bacteria and viruses entering/leaving the patient. Electrostatic filters achieve this by holding onto micro-organisms through the static electric charge in the medium. The pleated paper filter also known as a mechanical filter achieves this by tightly packed layers of mixed strands of glass fibres physically preventing bacteria and viruses from passing through.

HME's use the patients own moisture and humidity from expiration to humidify anaesthetic gases during inspiration. When endotracheal tubes are used, the upper airway that usually warms inspired air is bypassed and for patients that are anticipated to be under anaesthesia for long periods or ventilated patients, it is recommended that an HME/HMEF be used as prolonged dry gas exposure can have adverse effects.

## Properties of Filters and HMEF's

When considering filters a number of important properties should be taken in to account.

### 1 Filtration Efficiency

As many as 10-15% of intubated patients develop pneumonia at a level of 1-3% per day of intubation. These pneumonia's may prolong hospital stays by 4-9 days and contribute to as many as 15% of all hospital deaths.[1]

From this it is evident that filtration efficiency is paramount to protect the patient and ventilators from cross contamination. Flexicare filters provide protection against bacteria and viruses at a very high level of efficiency. This level of effectiveness is independently tested and verified by the Applied Centre for Microbiology and Research at Porton Down Salisbury giving confidence in our filter properties. Flexicare filters will maintain the specified level of efficiency for the full recommend period of use.

### 2 Humidification Abilities

To counteract the risk of actelectasis, epithelial damage and reduction of mucocillary transport, adequate humidification should be provided to long term intubated patients. HMEF's may not only act against these factors by providing humidification, their use is also thought to reduce the incidence of late onset Ventilator Associated Pneumonia compared to heated wire systems.[2]

It is recommended that HMEF humidification levels should be at least 30mg/L H2O at an inspired air at a temperature of 30C.[3] All Flexicare HMEF's exceed this minimum by providing a maximum moisture output performance of 32.3mg/L H2O as independently tested and verified by the Medical Device Agency (MDA).[4]

### 3 Light weight and ergonomically shaped

Flexicare Filters and HMEF's designs provide a rounded ergonomical shape to prevent pressure marking or discomfort for the patient. They are of light weight design thus reducing drag on breathing systems and are made of a clear material allowing visual observation in terms of potential obstructions.

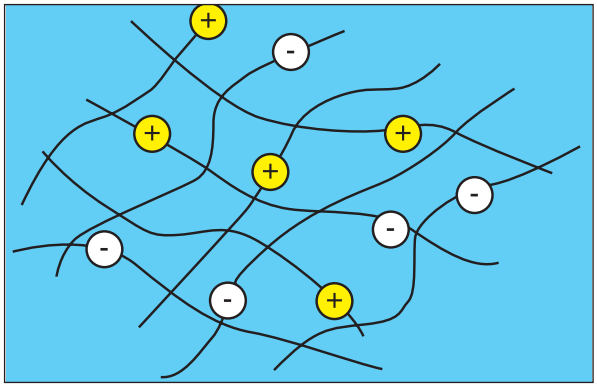
### 4 Minimal Dead Space and Minimal Pressure drop

Design of the filter housings must provide the smallest dead space possible whilst at the same time allowing a good gas flow with minimal resistance (pressure drop) through the filter media. The design of Flexicare Filters and HMEF's has incorporated a balance of these critical requirements to create a filter with minimal resistance to flow while maintaining a low dead space.

## Electrostatic Filters

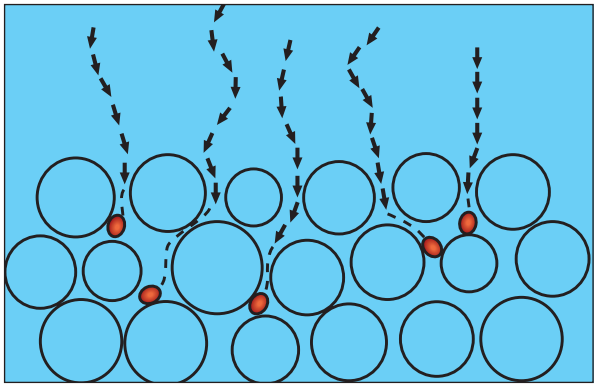
Electrostatic filters use a medium constructed of permanently bipolar charged rectangular split fibres which are able to capture airborne particles. The nature of this fibre material provides good strength and guarantees a long service life without significant degradation.

This type of filter is recommended for applications where high efficiency and low pressure drop is required. It offers excellent efficiency for anaesthetic breathing filters and pulmonary function filters.



## Mechanical Filters

Pleated paper filters use tightly packed layers of mixed strands of glass fibre filter paper. This non-uniform method of packing produces a thick layer of material. Particles are trapped in the tortuous path created by the crisscross mat. In principle, the medium used acts as a sieve, holding back unwanted particles while allowing anaesthetic gases and humidified air to travel through with minimum obstruction.



## Efficiency Testing

**The effectiveness of a filter is stated as a percentage (%) efficiency and is defined as:**

$$\frac{\text{cfu or pfu collected without BSF in place - cfu or pfu with BSF in place}}{\text{cfu or pfu without BSF in place}} \times 100$$

**cfu = colony forming units** **pfu = plaque forming units** **BSF = Breathing System Filter**

**Efficiency is measured by microbial penetration value which is defined as the number of colony forming units or plaque forming units passing through the filter per 10,000,000 challenge micro-organisms.**

**To test a filter for bacterial efficiency the filter is subjected to a pre-conditioning of 24 hours under relative humidity of 96% or more and temperature of 34°± 1 at a tidal volume of 500ml at 20 breaths per minute with I/E ratio of 1:2. Following this pre-conditioning the filters are challenged with microbial aerosols using the Henderson Apparatus to deliver a challenge of over 10,000,000 Bacillus Subtilis Var.Niger Spores (NCTC10073). For viral efficiency a RNA-Phage (MS-2 Coliphage) which is similar to the smallest human viruses is used to test the efficiency of the filter. The test results certify the proven high efficiency of Venticaire filters.**

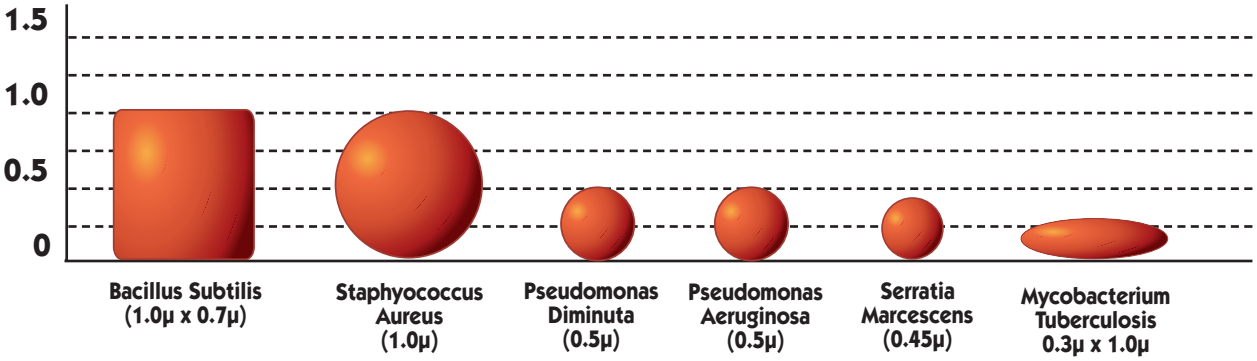
CAMR
Today's Research
Tomorrow's Health

The efficiency of the Venticaire filter is tested by the Centre for Applied Microbiology and Research at Porton Down, Salisbury, UK. Testing was done for bacterial and viral efficiency using Bacillus Subtilis and MS-2 Coliphage.

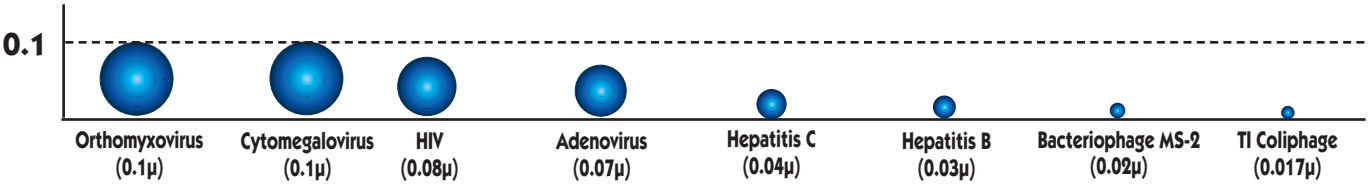
**Within the next few months the means for testing for filter efficiency will be undergoing changes.**

**The diagrams below highlight the size of test particles used in evaluating the efficiency of the Venticaire Filter.**

## Bacterial Particle Size (µ microns)




## Viral Particle Size (µ microns)




Independent tests confirm that the Venticaire® range of breathing filters prevent bacteria and viruses from passing between patients and ventilator equipment.

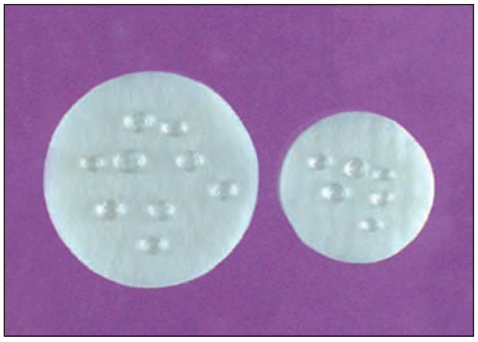
## Dead Space

**This is the internal air filled volume of the filter or HMEF. Dead Space contributes to the compliance of the breathing system as filters are placed between breathing systems and the patient.**

## Moisture Output

**This may be an important requirement for some patients who are being intubated over a long period of time. The unfortunate consequence of intubation is that the upper airway is bypassed and results in a loss of humidification of inspired air. Dry gases can have adverse effects and thus to prevent causing the patient trauma HMEF's play the role of acting as the humidifier in lieu of the upper airway.**

**"However, Humidification can cause rain-out in either direction. Venticaire® Filter medium has a double sided hydrophobic membrane which repels water and helps to maintain effective performance of the filter during its use. The picture illustrates that even large droplets of water are impervious to the filter medium."**



# Adult Electrostatic Breathing Filters & HME's

### Universal Connection
The 22M/15F connectors comply to BS EN ISO 5356 standard.

### Reduced Risk of Pressure Mark
The rounded shape of the filter body with no sharp edges reduces the risk of leaving pressure marks on the patient.

### Wide Choice
Venticaire offers a wide range of filters and HMEF with and without luer.

### Secure Luer Lock
The tethered Luer Lock cap is of a push fit design which is easy to operate and is secured with a strap, eliminating the risk of misplacement or accidental loss.

### Reduced drag on breathing systems
The light weight of Venticaire filters and HMEF reduces the drag on Breathing System.

| | PRODUCT CODE | DESCRIPTION | EFFICIENCY | HUMIDIFICATION | RESISTANCE | DEAD SPACE | WEIGHT GRAMS | PACK SIZE |
|---|---|---|---|---|---|---|---|---|
| | 038-41-350 | Adult Bacterial/Viral Filter + HME | 99.99% | 32mg/l air | 0.9cm $H_20$ at 30l/min | 69ml | 28 | 50 |
| | 038-41-355 | Adult Bacterial/Viral Filter + HME (with Luer lock Port) | 99.99% | 32mg/l air | 0.9cm $H_20$ at 30l/min | 69ml | 29 | 50 |
| | 038-41-360 | Adult Bacterial/Viral Filter | 99.99% | N/A | 0.6cm $H_20$ at 30l/min | 69ml | 24 | 50 |
| | 038-41-365 | Adult Bacterial/Viral Filter (with Luer lock Port) | 99.99% | N/A | 0.6cm $H_20$ at 30l/min | 69ml | 25 | 50 |
| | 038-41-366 | Adult Bacterial/Viral Filter (with Luer lock Port) + Low Profile Elbow (22M/15F) | 99.99% | N/A | 0.7cm $H_20$ at 30l/min | 76ml | 32 | 50 |
| | 038-41-356 | Adult Bacterial/Viral Filter + HME (with Luer lock Port) + Low Profile Elbow (22M/15F) | 99.99% | 32mg/l air | 1.0cm $H_20$ at 30l/min | 76ml | 36 | 50 |
| | 038-41-357 | Adult Bacterial/Viral Filter + HME (with Luer lock Port) + 15mm tube with 22F & 22M/15F Low Profile Elbow | 99.99% | 32mg/l air | 1.1cm $H_20$ at 30l/min | 96ml | 46 | 50 |
| | 038-41-359 | Adult Bacterial/Viral Filter + HME (with Luer lock Port) + Expandable Catheter Mount with Double Swivel Elbow & Elastomeric Cap | 99.99% | 32mg/l air | 1.0cm $H_20$ at 30l/min | 87-105ml | 47 | 50 |

# Mini Electrostatic Breathing Filters and HME's

## Ideal for Paediatric Use and Short term Adult Use

### Universal Connection
The 22M/15F connectors comply to BS EN ISO 5356 standard.

### Reduced Risk of Pressure Mark
The rounded shape of the filter body with no sharp edges reduces the risk of leaving pressure mark on the patient.

### Wide Choice
Venticaire offers a wide range of filters and HMEF with and without luer.

### Very Low Dead Space
Reduces the volume of rebreathing.

### Secure Luer Lock
The tethered Luer Lock cap is of a push fit design which is easy to operate and is secured with a strap, eliminating the risk of misplacement or accidental loss.

### Reduced drag on breathing systems
The light weight of Venticaire filters and HMEF reduces the drag on Breathing System.

| | PRODUCT CODE | DESCRIPTION | EFFICIENCY | HUMIDIFICATION | RESISTANCE | DEAD SPACE | WEIGHT GRAMS | PACK SIZE |
|---|---|---|---|---|---|---|---|---|
| | 038-42-350 | Mini Bacterial/Viral Filter + HME | 99.99% | 31mg/l air | 2.7cm $H_20$ at 30l/min | 28ml | 22 | 50 |
| | 038-42-355 | Mini Bacterial/Viral Filter + HME (with Luer lock Port) | 99.99% | 31mg/l air | 2.7cm $H_20$ at 30l/min | 28ml | 23 | 50 |
| | 038-42-360 | Mini Bacterial/Viral Filter | 99.99% | N/A | 1.9cm $H_20$ at 30l/min | 28ml | 19 | 50 |
| | 038-42-365 | Mini Bacterial/Viral Filter (with Luer Lock Port) | 99.99% | N/A | 1.9cm $H_20$ at 30l/min | 28ml | 20 | 50 |
| | 038-42-366 | Mini Bacterial/Viral Filter (with Luer Lock Port) + Low Profile Elbow (22M/15F) | 99.99% | N/A | 1.9cm $H_20$ at 30l/min | 35ml | 29 | 50 |
| | 038-42-356 | Mini Bacterial/Viral Filter + HME (with Luer Lock Port) + Low Profile Elbow (22M/15F) | 99.99% | 31mg/l air | 2.7cm $H_20$ at 30l/min | 35ml | 30 | 50 |
| | 038-42-357 | Mini Bacterial/Viral Filter + HME (with Luer Lock Port) + Expandable Catheter Mount with Double Swivel Elbow & Elastomeric Cap | 99.99% | 31mg/l air | 2.7cm $H_20$ at 30l/min | 46-64ml | 41 | 50 |

# Adult Pleated Hydrophobic Bacterial/Viral Filters

## Ideal for Long Term and ITU Use

### Secure Luer Lock
The tethered Luer Lock cap is of a push fit design which is easy to operate and is secured with a strap, eliminating the risk of misplacement or accidental loss.

### Wide Choice
Venticaire offers a wide range of filters to suit. Including HMEF with elbow or catheter mounts.

### Universal Connection
The 22M/15F connectors comply to BS EN ISO 5356 standard.

### Reduced Risk of Pressure Mark
The rounded shape with no sharp edges, reduces the risk of leaving pressure marks on the patient.

### Reduced drag on breathing Systems
The light weight of Venticaire filters and HMEF reduces the drag on Breathing System.

| | PRODUCT CODE | DESCRIPTION | EFFICIENCY | HUMIDIFICATION | RESISTANCE | DEAD SPACE | WEIGHT GRAMS | PACK SIZE |
|---|---|---|---|---|---|---|---|---|
| | 038-41-370 | Adult Pleated Hydrophobic Bacterial/Viral Filter | 99.99999% | 25mg $H_2O$/L at Vt500 | 1.4cm $H_2O$ at 30l/min | 74ml | 45 | 50 |
| | 038-41-375 | Adult Pleated Hydrophobic Bacterial/Viral Filter (with Luer lock Port) | 99.99999% | 25mg $H_2O$/L at Vt500 | 1.4cm $H_2O$ at 30l/min | 74ml | 48 | 50 |
| | 038-41-376 | Adult Pleated Hydrophobic Bacterial/Viral Filter with Luer Lock Port + expandable Catheter Mount with Double Swivel Elbow and Elastomeric Cap | 99.99999% | 25mg $H_2O$/L at Vt500 | 1.4cm $H_2O$ at 30l/min | 92-110ml | 66 | 50 |

# Paediatric Pleated Hydrophobic Bacterial/Viral Filters

## Ideal for Paediatric Long Term and ITU Use

### Secure Luer Lock

The tethered Luer Lock cap is of a push fit design which is easy to operate and is secured with a strap, eliminating the risk of misplacement or accidental loss.

### Universal Connection

The 22M/15F connectors comply to BS EN ISO 5356 standard.

### Reduced Risk of Pressure Mark

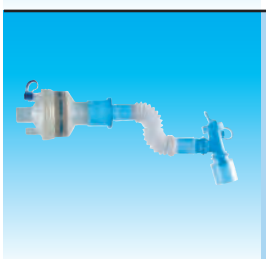
The rounded shape with no sharp edges, reduces the risk of leaving pressure marks on the patient.

### Wide Choice

Venticaire offers a wide range of filters to suit. Including HMEF with elbow or catheter mounts.

### Reduced drag on breathing Systems

The light weight of Venticaire filters and HMEF reduces the drag on Breathing System.

| | PRODUCT CODE | DESCRIPTION | EFFICIENCY | HUMIDIFICATION | RESISTANCE | DEAD SPACE | WEIGHT GRAMS | PACK SIZE |
|---|---|---|---|---|---|---|---|---|
| | 038-42-380 | Paediatric Pleated Hydrophobic Bacterial/Viral Filter | 99.9999% | 25mg $H_2O$/L at Vt500 | 2.7cm $H_2O$ at 30l/min | 38ml | 26 | 50 |
| | 038-42-385 | Paediatric Pleated Hydrophobic Bacterial/Viral Filter (with Luer Lock Port) | 99.9999% | 25mg $H_2O$/L at Vt500 | 2.7cm $H_2O$ at 30l/min | 38ml | 29 | 50 |
|  | 038-42-386 | Paediatric Pleated Hydrophobic Bacterial/Viral Filter with Luer Lock port + Expandable Catheter Mount with Double Swivel Elbow and Elastomeric Cap | 99.9999% | 25mg $H_2O$/L at Vt500 | 2.8cm $H_2O$ at 30l/min | 56-74ml | 47 | 50 |

# Recommended for Further Reading


1 Hedley RM, Allt-Graham J.
Heat and moisture exchangers and breathing filters
Br J Anaesth 1994, 73:227-236

2 Le Bourdelles G, Mier L, Fiquet B, et al.
Comparison of the effects of heat and moisture exchangers and heated humidifiers on ventilation and gas exchangers during weaning trials from mechanical ventilation.
Chest 1996, 110:1294-1298

3 Ackerstaff AH, Hilgers FJ, Aaronson NK, et al.
Improvements in respiratory and psychosocial functioning following total laryngectomy by the use of a heat and moisture exchanger. Ann Otol Rhinol Laryngol 1993;102:878-83

4 Pelosi P, Solca M, Ravagnan I, et al.
Effects of heat and moisture exchangers on minute ventilation, ventilatory drive, and work of breathing during pressure-support ventilation in acute respiratory failure.
Crit Care Med 1996, 24:1184-11188

5 Djedaini K, Billiard M, Mier L, et all.
Changing heat and moisture exchangers every 48 hours rather than 24 hours does not affect their efficacy and the incidence of nosocomial pneumonia.
Am J Crit Care Med 1995,152:1562-1569

6 Roustan JP. Kielan J, Aubas P, du Cailar J.
Comparison of hydrophobic heat and moisture exchangers with heated humidifier during prolonged mechanical ventilation
Intens Care Med 1992, 18:97-100

7 Thomachot L, Vialet R, Viguier JM, et al.
Efficacy of heat and moisture exchangers after changing every 48 hours rather than 24 hours.
Crit Care Med 1998,26:477-488

8 Conti G, Dr Blasi RA, Rocco M. et al.
Effects of the heat-moisture exchangers on dynamic hyperinflation of mechanically ventilated COPD patients.
Intens Care Med 1990,16:144-443


## References


1 Skerrett, S. J. Associate Professor of Medicine, Division of Pulmonary & Critical Care Medicine, University of Washington Seattle, USA

2 Kirton et al (1997) Aprospective Randomised comparison of an In-line Heat and Moisture Exchange filter and Heated Wire Humidifiers chest/112/4/October 1997

3 American Association of Respiratory Care AARC, Respiratory Care 1992;37:887-890 (N.B There is no International Standard BS EN ISO 9360-1:2000)

4 MDA Breathing System Filters Evaluation 02069


## Notes

# Catheter Mounts, Anaesthetic Face Masks, Soda Lime & Accessories

# Anaesthetic Face Masks, Catheter Mounts & Accessories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# Introduction

Flexicare offers a wide range of single patient use components and accessories to compliment the Breathing Systems and Breathing Filters using anaesthesia and intensive care.

### Anaesthetic Face Masks

There is an increasing trend for clinical practices to adopt the use of single patient devices to prevent the risk of cross contamination. Anaesthetic Face Masks come into close contact with patients and have traditionally been made of black rubber. However, studies have shown that even after sterilisation, there still remains evidence of bacterium which has the potential to cross infect another patient.

Flexicare have a wide range of single patient use Anaesthetic Face Masks available in all sizes to meet patient requirements. All the face masks share a clear dome construction which provides visual inspection of the patient status.

### VentiSorb

VentiSorb is a carbon dioxide absorbent with excellent efficiency and low resistance for use within closed circle systems. Used in conjunction with either a parallel lack system or bain circuit, the soda lime will absorb the patient's exhaled $CO_2$ and therefore allowing rebreathing of the expired anaesthetic gases.

### Catheter Mounts

The purpose of a catheter mount is to reduce the drag on the endotracheal tube or laryngeal mask by transferring the weight of the breathing system away from the patient. It has the added benefit that the filter does not need to rest on the patient's head and thus eliminates pressure marks that would alternatively been left on the patient.

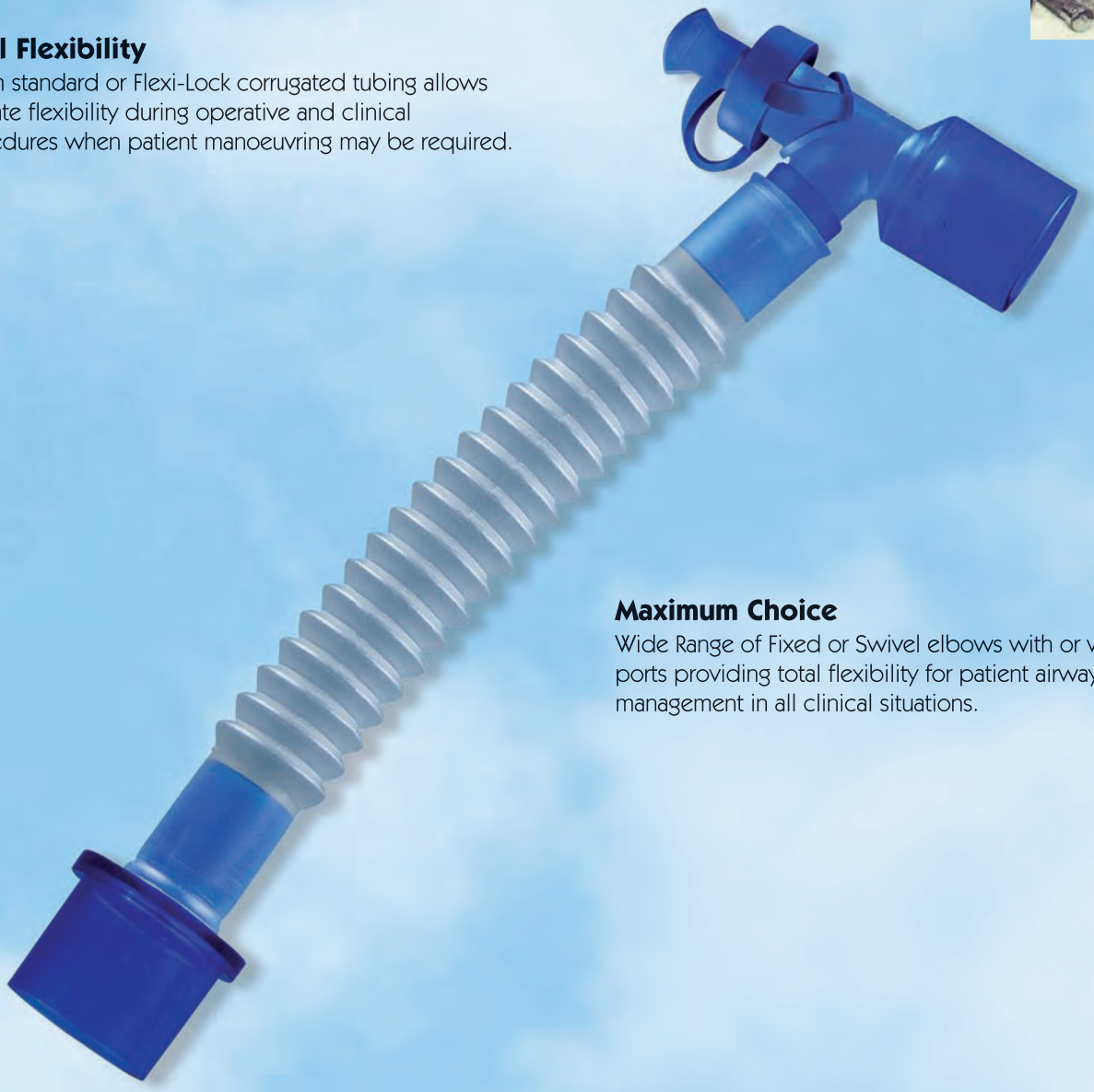
There is a wide range of catheter mounts available to meet clinician and patient needs. The standard range of catheter mounts use 15mm corrugated tubing with the corrugation depth being minimal to decrease airflow disturbance.

Flexicare also offer the catheter mounts in the Flexi-lock tubing which allows clinicians to alter dead space and have greater control of the attached filter and breathing system position during surgery or in the ITU environment.

There is also the choice of Smooth Bore Tube catheter mounts. The internal diameter measures 15mm and has a protective outer casing to reduce the risk of kinking.

# Catheter Mounts

**Total Flexibility**
15mm standard or Flexi-Lock corrugated tubing allows ultimate flexibility during operative and clinical procedures when patient manoeuvring may be required.



**Maximum Choice**
Wide Range of Fixed or Swivel elbows with or without ports providing total flexibility for patient airway management in all clinical situations.

**Secure Fitting**
**22mm F or 15mm M** end connectors allow for secure fitting to all Y Pieces meeting the approved standards.

**A wide range of Catheter Mounts with either standard or Flexi-Lock corrugated tubing, and a wide variety of fixed or swivel elbows and connectors offering total flexibility.**

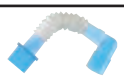
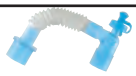
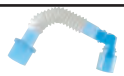
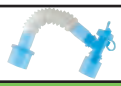
# Catheter Mounts

**A wide range of catheter mounts are available with either Standard, Flexi-Lock or Smooth Bore tubing with a variety of fixed or swivel elbows and connectors offering total flexibility.**

## Standard 15mm Tube

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 038-61-301 | 22mm F and 15mm F connectors | 50 |
| | 038-61-302 | 22mm F connector and 15mm F/22mm M Low Profile Elbow | 50 |
| | 038-61-303 | 22mm F connector and 15mm F/22mm M Luer Lock Elbow | 50 |
| | 038-61-304 | 22mm F connector and 15mm F/22mm M Elbow with Elastomeric Cap | 50 |
| | 038-61-305 | 22mm F connector and 15mm F/22mm M Double Swivel Elbow | 50 |
| | 038-61-306 | 22mm F connector and 15mm F/22mm M Double Swivel Elbow with Elastomeric Cap | 50 |

## Expandable Flexi-Lock Tube

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 038-61-310 | 15mm M and 15mm F connectors | 50 |
| | 038-61-311 | 22mm F and 15mm F connectors | 50 |
|  | 038-61-312 | 22mm F connector and 15mm F/22mm M Low Profile Elbow | 50 |
| | 038-61-313 | 22mm F connector and 15mm F/22mm M Luer Lock Elbow | 50 |
|  | 038-61-314 | 22mm F connector and 15mm F/22mm M Elbow with Elastomeric Cap | 50 |
|  | 038-61-315 | 22mm F connector and 15mm F/22mm M Double Swivel Elbow | 50 |
|  | 038-61-316 | 22mm F connector and 15mm F/22mm M Double Swivel Elbow with Elastomeric Cap | 50 |

## Smooth Bore Tube

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 038-61-321 | 22mm F and 15mm F connectors | 50 |
| | 038-61-322 | 22mm F connector and 15mm F/22mm M Low Profile Elbow | 50 |
| | 038-61-323 | 22mm F connector and 15mm F/22mm M Luer Lock Elbow | 50 |
| | 038-61-324 | 22mm F connector and 15mm F/22mm M Elbow with Elastomeric Cap | 50 |
| | 038-61-325 | 22mm F connector and 15mm F/22mm M Double Swivel Elbow | 50 |
| | 038-61-326 | 22mm F connector and 15mm F/22mm M Double Swivel Elbow with Elastomeric Cap | 50 |

**For total airway management with confidence**

# Scented Inflatable Anaesthetic Face Masks

**Some patients receiving anaesthesia, particularly children, can find the experience unpleasant.**

**The Venticaire® range of scented anaesthetic face masks offered in two aromas helps to overcome this problem.**

### Scented Mask
Available in Lemon, Strawberry and Plain.

### Inflatable Cushion
The seal can be enhanced by inflating/deflating the cushion to suit the patient's anatomical contour.

### Colour Coding
The masks are colour coded to identify the flavour. Yellow (Lemon), Red (Strawberry), Clear (Plain).

### Ease of Observation
Clear face piece allows visual observation of patient status.

### Soft Cushion
Smooth material used for the cushion allows for a tight seal whilst providing patient comfort.

### Size Colour Coding
The hooks are colour coded to provide mask size identification.

# Scented Inflatable Anaesthetic Face Masks

## Lemon Scented Inflatable Disposable Anaesthetic Face Mask

| PRODUCT CODE | DESCRIPTION | SIZE | PACK SIZE |
|---|---|---|---|
| 038-51-400 SFL | Large Adult | 5 | 50 |
| 038-51-410 SFL | Adult | 4 | 50 |
| 038-52-415 SFL | Large Child | 3 | 50 |
| 038-52-420 SFL | Medium child | 2 | 50 |
| 038-52-430 SFL | Small Child | 1 | 50 |
| 038-53-440 SFL | Neonatal | 0 | 50 |

## Strawberry Scented Inflatable Disposable Anaesthetic Face Mask

| PRODUCT CODE | DESCRIPTION | SIZE | PACK SIZE |
|---|---|---|---|
| 038-52-415 SFS | Large Child | 3 | 50 |
| 038-52-420 SFS | Medium child | 2 | 50 |
| 038-52-430 SFS | Small Child | 1 | 50 |
| 038-53-440 SFS | Neonatal | 0 | 50 |

## Inflatable Disposable Anaesthetic Face Mask

| PRODUCT CODE | DESCRIPTION | SIZE | PACK SIZE |
|---|---|---|---|
| 038-51-400 SFP | Large Adult | 5 | 50 |
| 038-51-410 SFP | Adult | 4 | 50 |
| 038-52-415 SFP | Large Child | 3 | 50 |
| 038-52-420 SFP | Medium child | 2 | 50 |
| 038-52-430 SFP | Small Child | 1 | 50 |
| 038-53-440 SFP | Neonatal | 0 | 50 |

# Inflatable Anaesthetic Face Mask

### Pre-inflated Cushion
The cushion is filled to an optimum level ensuring a maximum seal reducing the risk of leakage.

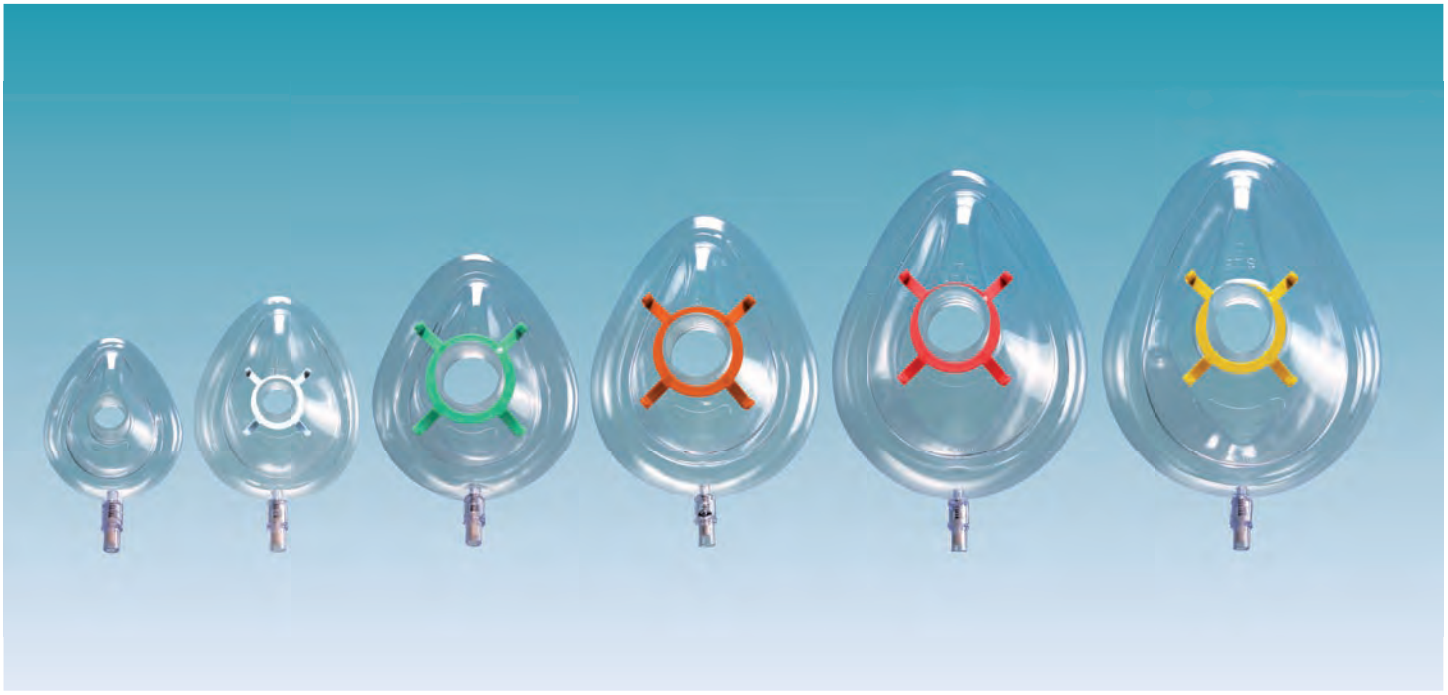
### Eliminating Risk of Allergic Reaction to Latex
The mask is totally latex free.

### Eliminates Risk of Cross Contamination
The single patient use mask eliminates the risk of cross contamination.

### Clear Dome Construction
Enables visual inspection of patient status and provides a secure grip for the user.

### ISO Standard Fitting
Ensures compatibility with all standard catheter mounts and breathing systems with 22mm and 15mm connectors.

### Size Colour Coding
Available in six sizes from Neonatal to Large Adult, with individually colour coded hooks for ease of visual identification.



### Pre-Filled Disposable Anaesthetic Face Mask

| Product Code | Description | Size | Pack Size |
|---|---|---|---|
| 038-51-400 | Large Adult | 5 | 50 |
| 038-51-410 | Adult | 4 | 50 |
| 038-52-415 | Large Child | 3 | 50 |
| 038-52-420 | Medium child | 2 | 50 |
| 038-52-430 | Small Child | 1 | 50 |
| 038-53-440 | Neonatal | 0 | 50 |

All Pre-Filled Disposable Anaesthetic Face Masks are supplied without the hooks fitted, but are included in the pack if required for use.

# Reusable Silicone Anaesthetic Face Masks

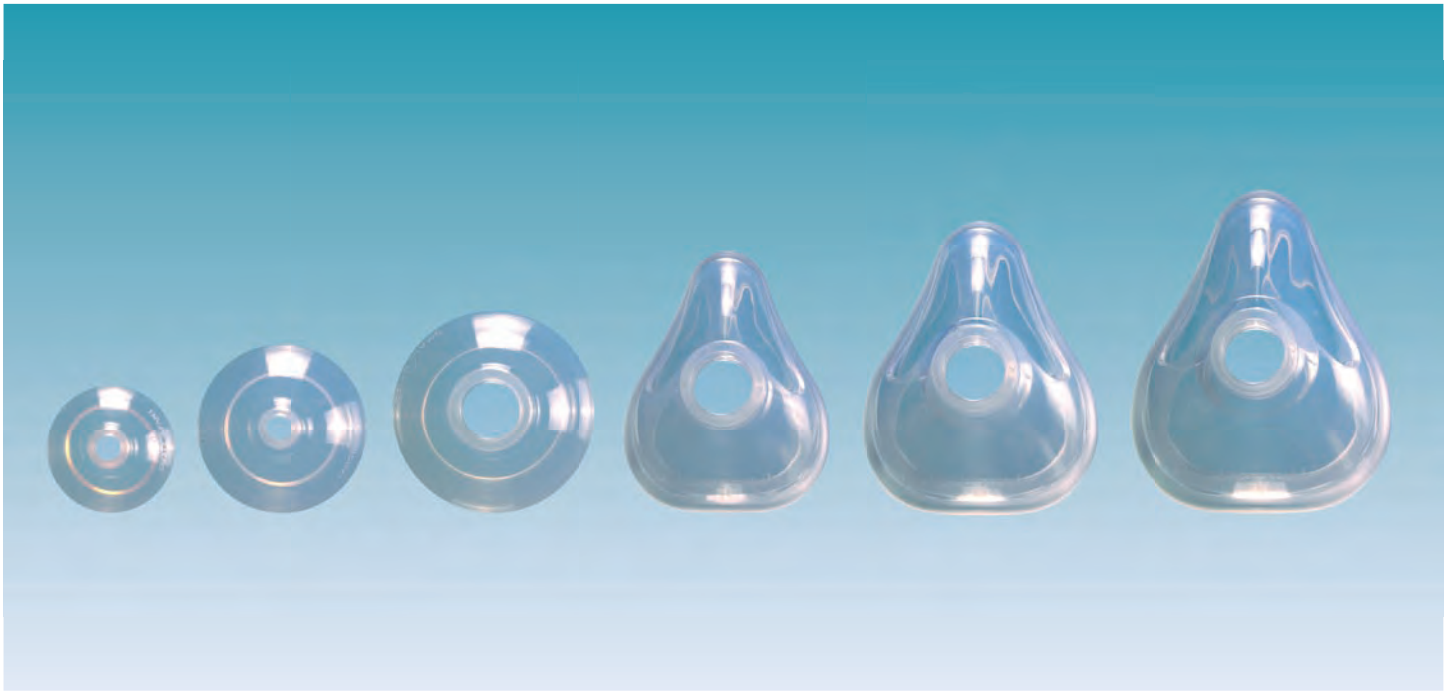
### Latex Free
Eliminating the risk of allergic reactions to latex.

### Fully Autoclavable
Venticaire silicone masks are designed to be autoclaved up to 50 times.

### Transparent Face Piece
Allows patient monitoring at all times and is better tolerated by the patient.

### Soft Edges
The moulded texture of the rim has been designed to ensure maximum patient comfort and a tight seal.

### British Standard Compliant Connector
22mm and 15mm connectors ensures compatibility with all standard catheter mounts and breathing systems.



**Silicone Reusable Anaesthetic Face Mask**

| Product Code | Description | Size | Pack Size |
|---|---|---|---|
| 038-51-400 SIL | Large Adult | 5 | 10 |
| 038-51-410 SIL | Adult | 4 | 10 |
| 038-52-415 SIL | Large Child | 3 | 10 |
| 038-52-420 SIL | Medium child | 2 | 10 |
| 038-52-430 SIL | Small Child | 1 | 10 |
| 038-53-440 SIL | Neonatal | 0 | 10 |

# Ventisorb® $CO_2$ Absorbent

**VentiSorb® is a carbon dioxide absorbent with excellent efficiency and low resistance for use within closed circle systems**

VentiSorb® is a medical grade soda lime prepared in granulated form. The individual granules are specifically non-uniform in shape and size so that $CO_2$ filtration is maximised without restricting airflow. VentiSorb® offers excellent efficiency in absorbing carbon dioxide and other acidic contamination from the gas stream while minimising dust particle formation. The chemical attributes of the active compound is naturally porous and hard which acts as a heat and moisture exchange.

The use of closed circuit systems within the theatre environment has increased dramatically over the last few years in that low flow capability allows for use on paediatrics as well as adults. The use of VentiSorb® in closed systems offers the following benefits:

- **Increased Moisture Output**
- **Improved Heat Retention**
- **Minimal Anaesthetic Agent Degradation**

## Moisture Output

When the patient is incubated the upper airway is bypassed and results in a loss of humidity through exhaled gases. Oxygen and anaesthetic gases are dry and can have adverse effects and damage the mucosal wall of the respiratory tract.

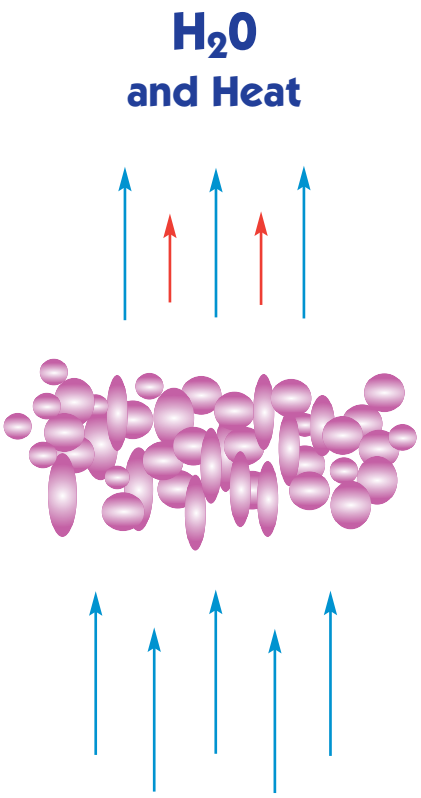
While the nature of closed systems allows for expired gases to be returned to the patient and thus some of the moisture, VentiSorb® plays an active role in producing moisture. The chemical reaction between the expelled carbon dioxide gases and that of the calcium and sodium hydroxide compound releases water molecules that can then be used to humidify the inspired air in lieu of the upper airway.

## Heat Retention

VentiSorb®'s active ingredients when exposed to $CO_2$ not only produces moisture but releases heat as a by-product. This reaction warms the gases and creates ambient humidity.

## Minimal Agent Degredation

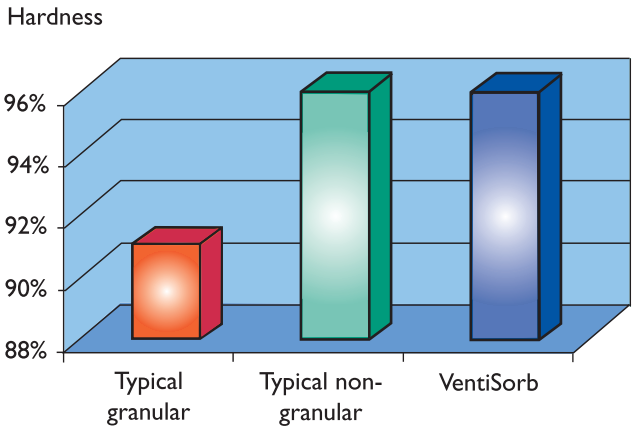
VentiSorb® does not contain any added Potassium Hydroxide (KOH), therefore, minimising agent degredation products such as compound A and Carbon Monoxide.



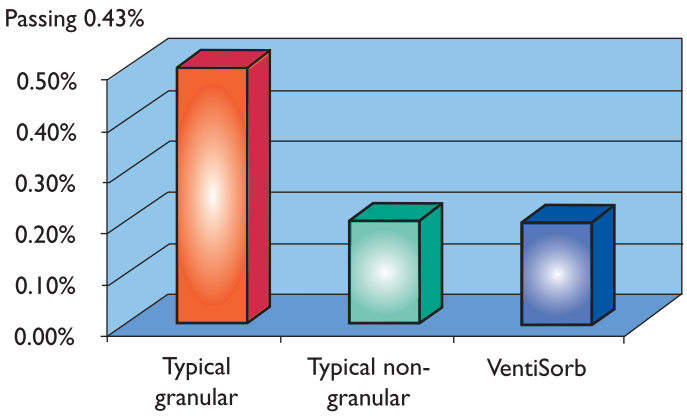

## Physical Characteristics

The graphs below demonstrates VentiSorb's physical characteristics in comparison to other Soda Lime absorbers.

### Attrition Resistance




### Dust



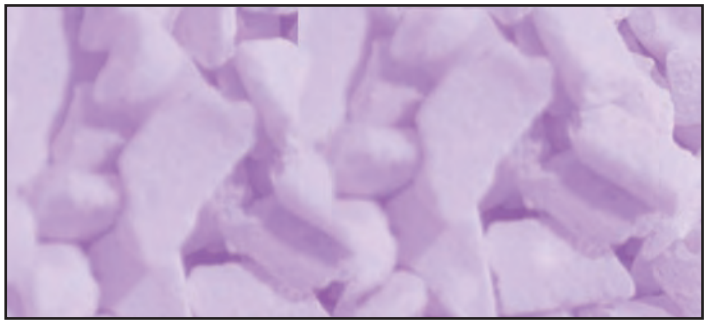
# Ventisorb® $CO_2$ Absorbent

## Colour Change Indicator

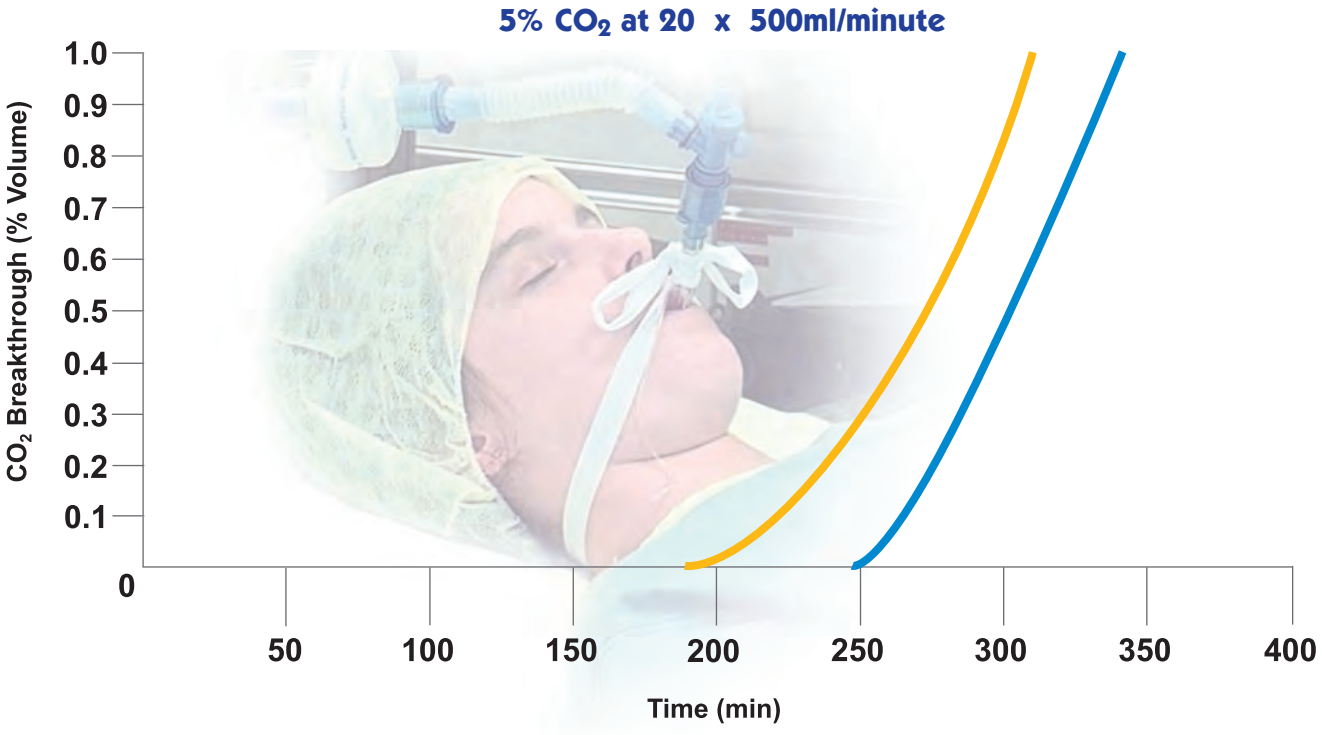
Ventisorb® is available in two different colour change indicators both conforming to international standards. They are either from Pink to White or from White to Violet. Both give clear visual indications as to the extent of the $CO_2$ absorption and the life extent of the soda lime.

## Particle Packing

Ventisorb® granules range from 2.5-5.0 in size, allowing for a tightly packed layered canister increasing the efficiency of the $CO_2$ absorption without significantly increasing resistance.



## Simulated Use Test




The graph depicts the results using Ventisorb® and a non-granular brand under simulated and controlled minimal flow conditions. It clearly shows that the amount of time that elapses before $CO_2$ begins to breakthrough is substantial and that there is a constant rate of utilisation after 270 minutes, giving Ventisorb® a greater than 10% performance advantage.

# Ventisorb® $CO_2$ Absorbent

## Operator Benefits

The benefits of using closed circle systems for their low flow anaesthesia delivery capabilities extends beyond patient benefits. The implication for the operating department being that anaesthetic gases used to induce patients does not unnecessarily pollute the operating room.

Secondly it has the added advantage of being cost efficient in that the amount of fresh gas needed to maintain anaesthesia is lower than that of open systems. The difference being the opportunity of cost between 2-3 litres/min for closed systems and 6-8 litres/min for open systems.

| Specification | Grade | Particle Size mesh | Particle Size mm | $CO_2$ Capacity (litres $CO_2$ /kg) | Hardness |
|---|---|---|---|---|---|
| US Pharmacopoeia | USP | 4-8 | 2.5-5.0 | >140 | >90 |

**When exhausted Ventisorb® will change colour indicating that the soda lime needs to be changed. This should be used alongside a CO2 monitor to confirm compound exhaustion.**

| PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|
| 038-05-601 | 1.3 kg Ventisorb® supplied in resealable bags Pink to White | 12 |
| 038-05-602 | 4.5 kg Ventisorb® supplied in closable container Pink to White | 2 |
| 038-05-603 | 1.3 kg Ventisorb® supplied in resealable bags White to Violet | 12 |
| 038-05-604 | 4.5 kg Ventisorb® supplied in closable container White to Violet | 2 |

**For total airway management with confidence**

# Breathing Systems Components Accessories

## Connectors

**010-610**
22mm Male/Female Serrated Connector
Pack of 100

**010-611**
22mm Male 22mm M/15mm F Connector
Pack of 100

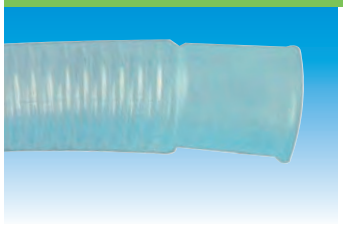
**010-612**
22mm Female/15mm Male Connector
Pack of 100

**010-613**
15mm Male/Male Connector
Pack of 100

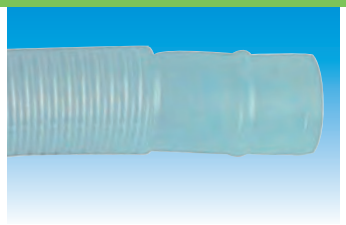
**010-614**
15mm Male/Female Connector
Pack of 100

**010-617**
22M/30F Scavenging Connector
Pack of 50

## Corrugated Tube

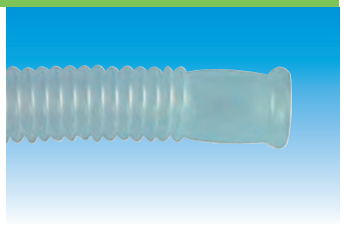


**038-01-225**
22mm Corrugated Tube 45cm repeat in dispensing box (50 metre)
1 roll



**038-01-226**
22mm Corrugated Tube 45cm repeat in dispensing box (50 metre) Low Compliance for Ventilators
1 roll

**038-01-227**
Blue 22mm Corrugated Tube for scavenging 45cm repeat in dispensing box (50 metre)
1 roll



**038-02-225**
15mm Corrugated Tube 45cm repeat in dispensing box (50 metre)
1 roll

## Elbows

**010-640**
Elbow Low Profile (22M/15F)
Pack of 50

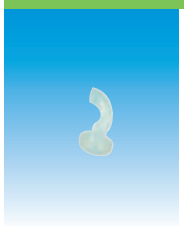
**010-641**
Elbow with Luer Lock Port (22M/15F)
Pack of 50

**010-642**
Elbow with Elastomeric Cap for suction (22M/15F)
Pack of 50

**010-643**
Double Swivel Elbow (22M/15F)
Pack of 50

**010-645**
Double Swivel Elbow with Elastomeric Cap for suction (22M/15F)
Pack of 50

## Guedel Airways (Sterile)



**038-93-900**
Size 000 without Bite Block
Pack of 100

**038-92-902**
Size 00 with Blue Bite Block
Pack of 100

**038-92-900**
Size 0 with Black Bite Block
Pack of 100

**038-91-910**
Size 1 with White Bite Block
Pack of 100

**038-91-920**
Size 2 with Green Bite Block
Pack of 100

**038-91-930**
Size 3 with Orange Bite Block
Pack of 100

**038-91-940**
Size 4 with Red Bite Block
Pack of 100

# Breathing Systems Components Accessories

## Monitoring Lines

**010-700**
Monitoring Line with Male/Male Luer Lock Connectors, 2metre tubing
Pack of 25

**010-705**
Monitoring Line with Female/Female Luer Lock Connectors, 2metre tubing
Pack of 25

**010-710**
Monitoring Line with Male/Female Luer Lock Connectors, 2 metre tubing
Pack of 25

## Reservoir Bags (Latex Free)

**038-81-830NL** - 3 litre Reservoir Bag with 22mm Female Connector 10's

**038-81-820NL** - 2 litre Reservoir Bag with 22mm Female Connector 10's

**038-82-810NL** - 1.0 litre Reservoir Bag with 22mm Female Connector 10's

**038-83-805NL** - 0.5 litre Reservoir Bag with 22mm Female Connector (closed tail) 10's

**038-82-805NL** - 0.5 litre Reservoir Bag with 15mm Female Connector (open tail) 10's

## Water Trap

**020-650**
Paediatric Self Sealing Water Trap
Pack of 10

**010-650**
Adult Self Sealing Water Trap
Pack of 10

## T Piece

**010-630**
22mm Male/Male/Male T Piece
Pack of 50

**010-631**
22mm Male/Male/Female T Piece
Pack of 50

**010-633**
22mm Male/Male/Male T Piece with Port
Pack of 50

**010-634**
22mm Male/Male/Female T Piece with Port
Pack of 50

## Y Piece

**010-620**
22mm Plain Parallel Y Piece
Pack of 50

**010-621**
22mm Parallel Y Piece with Monitoring Ports
Pack of 50

**010-622**
22mm Parallel Y Piece with $CO_2$ Luer Lock Port
Pack of 50

**010-623**
22mm Swivel Y Piece
Pack of 50

**020-620**
15mm Plain Parallel Y Piece
Pack of 50

**020-621**
15mm Y-Piece with monitoring ports
Pack of 50

# Breathing Systems Components Accessories

## Connectors

**010-601**
22mm Male/Female with Barbed Right Angled Connector
Pack of 50

**010-602**
22mm Male/Female with Luer Right Angled Port
Pack of 50

**010-603**
22mm Female/Female with Luer Right Angled Port
Pack of 50

**010-604**
22mm Female/Female Connector with Port and Plug
Pack of 50

## Connectors

**010-605**
22mm Male/Female Connector with Port and Plug
Pack of 50

## Washington T-Pieces

**010-638**
15mm Male 22mm Male/15mm Female with Luer Right Angled Port
Pack of 50

**010-639**
15mm Male 22mm Male/15mm Female with Barbed Right Angled Connector
Pack of 50

## Recommended for Further Reading


1 Kleemann, P.P.
Humidity of anaesthetic gases with respect to low flow anaesthesia.
Anaesthesia and Intensive Care, 1994, 22 (4), 396-408.


## Notes

# Laryngoscopes

# Laryngoscopes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# Introduction

First introduced by Sir Robert Macintosh and Sir Ivan Magill in the early 1940's, the Laryngoscope has evolved since its inception. It followed the creation of the Endotracheal tube to permit leverage to push the tongue back and provide light to allow visualisation of the vocal chords for accurate placement of the airway.

Laryngoscopes can be primarily classified into two categories as defined by their light source.

### 1 Standard Laryngoscopes

The Standard Laryngoscope, also referred to as Conventional Laryngoscopes, has a light bulb incorporated into blade, approximately 1/3 of the distance from the tip. The light bulb screws into position and is powered via an integral line that transfers the power from the source. The power source is located within the handle in the form of conventional batteries.

### 2 Fibre Optic Laryngoscopes

The major difference in between the Standard Laryngoscope and the Fibre Optic Laryngoscope is the location of the bulb. In the Fibre Optic System, the bulb is housed within the handle with the light transmitted via an optic bundle.

The main advantage that this System presents is that its transmits light but does not transfer heat and thus eliminating the risk of burns within the patient's oral cavity. There is also the added advantage of one-piece autoclaving. The fibre optic bundle can remain in situ and does not have to be removed during the cleaning process.

### Disposable Blades

Until recently, laryngoscopes were primarily made of stainless steel. However, due to the recent issues involving CJD (prions) where decontamination of the blades could not be ensured, there remains a risk of cross infection. As a measure to combat the potential risk of cross contamination there has been a move towards Disposable Blades. Recent studies have also shown that Laryngoscope Handles are a major source of cross contamination, with few being sterilised as often as needed.

The BriteBlade® is a Disposable Fibre Optic Blade designed for single patient use which eliminates the risk of cross contamination from both blade and handle. It has a unique and patented hinge design that prevents the folded blade from touching the handle. Thus eliminating the need for disposable handles or sleeves.

### Difficult Intubation

Flexicare also provide Laryngoscopes for difficult intubations. The Mc Coy system clears the tongue further than is possible with the conventional designed laryngoscopes to allow positive identification of the airway.

# Standard Macintosh Blades

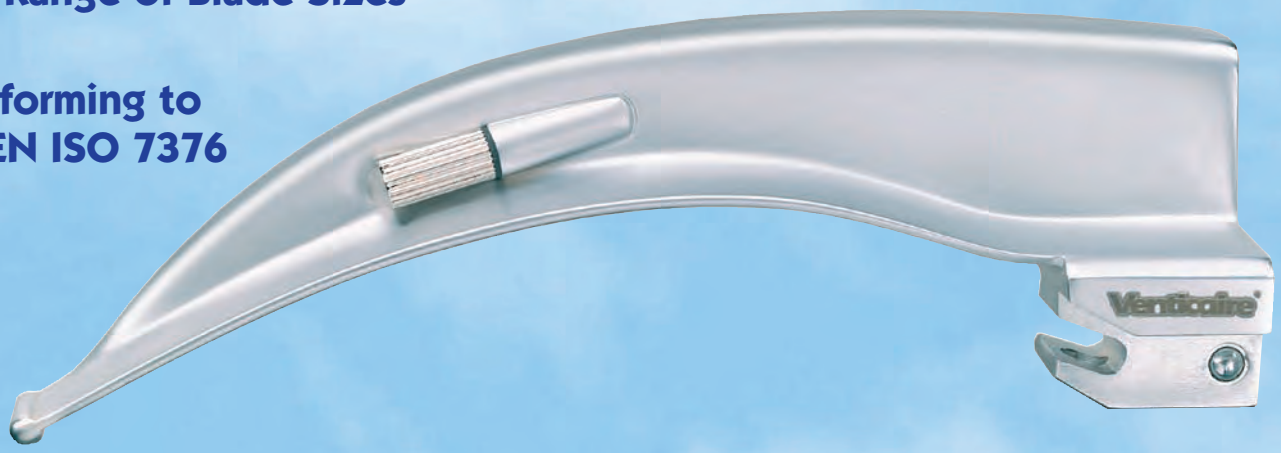
## High Quality Stainless Steel

The distance from the bulb to the blade tip will protect the patient from accidental burns.

## Fully Autoclavable Blades

## Full Range of Blade Sizes

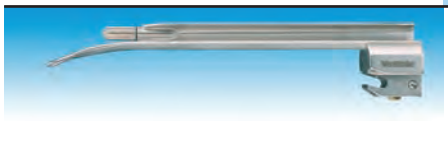
## Conforming to BS EN ISO 7376



**The standard Range of Laryngoscopes are manufactured from high quality stainless steel giving long life to both blades and handles. The light bulb in the blade can easily be changed and the distance from the bulb from the blade tip will protect the patient from accidental burns, whilst providing a high level of illumination**

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 040-110 | Standard Macintosh No 1 | 1 |
| | 040-111 | Standard Macintosh No 2 | 1 |
| | 040-112 | Standard Macintosh No 3 | 1 |
| | 040-113 | Standard Macintosh No 4 | 1 |

# Standard Miller Blades

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 040-127 | Standard Oxy Miller No 00± | 1 |
| | 040-129 | Standard Miller No 00 | 1 |
| | 040-128 | Standard Oxy Miller No 0 | 1 |
| | 040-130 | Standard Miller No 0 | 1 |
| | 040-131 | Standard Miller No 1 | 1 |
| | 040-132 | Standard Miller No 2 | 1 |
|  | 040-133 | Standard Miller No 3 | 1 |
| | 040-134 | Standard Miller No 4 | 1 |

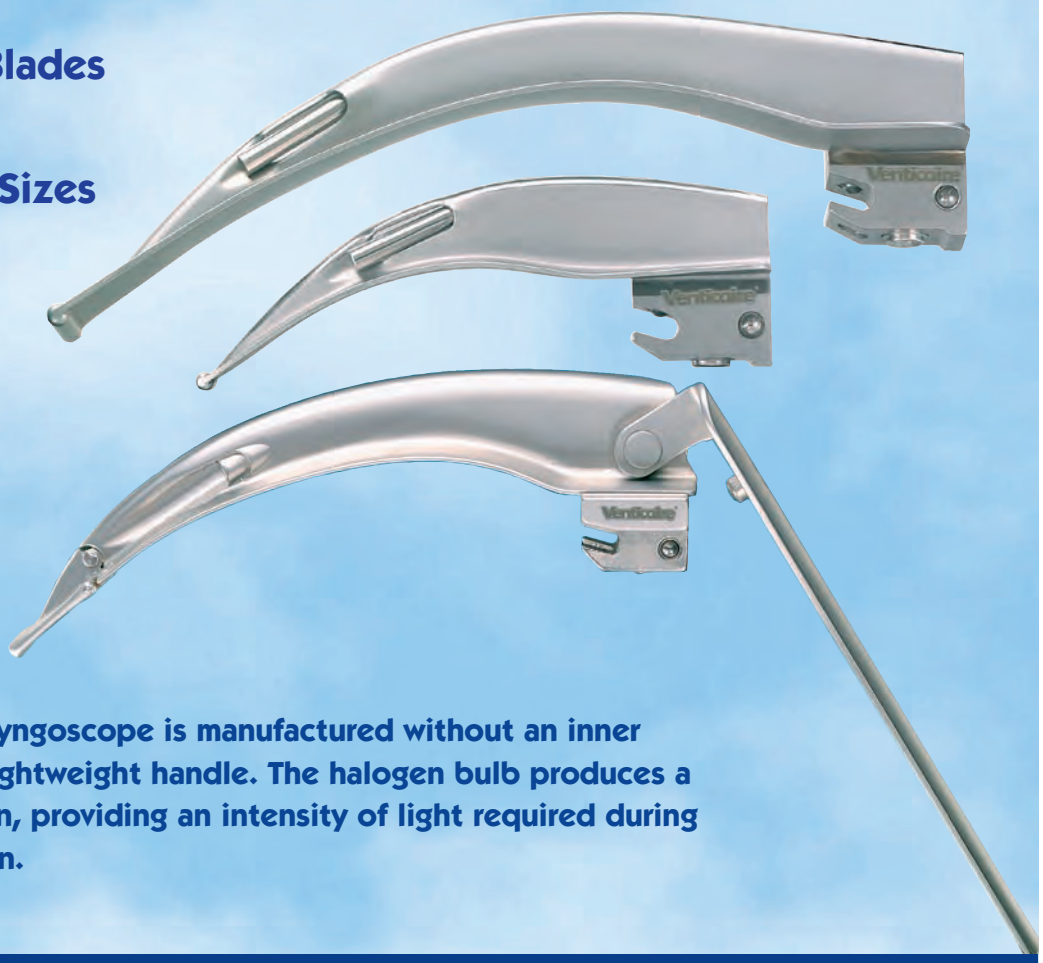
**For total airway management with confidence**

# Fibre Optic (Green Spec) Macintosh Blades & Flexible Blades

**Fully Autoclavable Blades**

**Full Range of Blade Sizes**

**Conforming to BS EN ISO 7376**

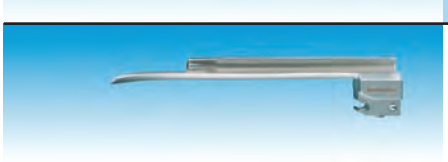


**Venticaire's Fibre optic Laryngoscope is manufactured without an inner sleeve, thus producing a lightweight handle. The halogen bulb produces a cold yet bright illumination, providing an intensity of light required during examination and intubation.**

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 040-831 | Fibre Optic Macintosh No 1 | 1 |
| | 040-832 | Fibre Optic Macintosh No 2 | 1 |
| | 040-833 | Fibre Optic Macintosh No 3 | 1 |
| | 040-834 | Fibre Optic Macintosh No 4 | 1 |
| | 040-835<br>040-836 | Flexible Fibre Optic No 3<br>Flexible Fibre Optic No 4 | 1<br>1 |

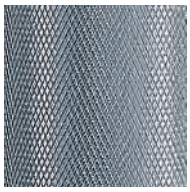
**For total airway management with confidence**

# Fibre Optic (Green Spec) Miller Blades

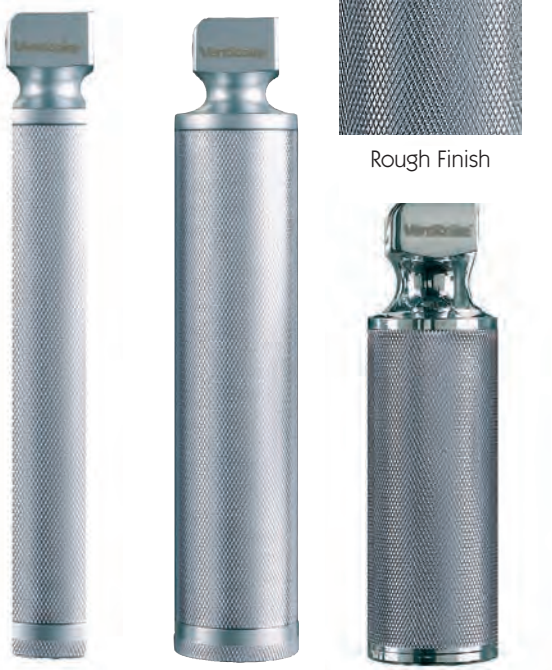
| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 040-840 | Fibre Optic Oxy Miller No 00 | 1 |
| | 040-849 | Fibre Optic Miller No 00 | 1 |
| | 040-841 | Fibre Optic Oxy Miller No 0 | 1 |
| | 040-850 | Fibre Optic Miller No 0 | 1 |
|  | 040-851 | Fibre Optic Miller No 1 | 1 |
| | 040-852 | Fibre Optic Miller No 2 | 1 |
| | 040-853 | Fibre Optic Miller No 3 | 1 |
| | 040-854 | Fibre Optic Miller No 4 | 1 |

# Standard Handles and Box Sets

All handles are Bi-Polar, allowing the Laryngoscope to function irrespective of which way the batteries are inserted. The handles can also be opened from both ends (top and bottom) in order to remove swelled batteries with ease.



Rough Finish



Mini Standard Stubby

Satin Finish

Mini Standard Stubby

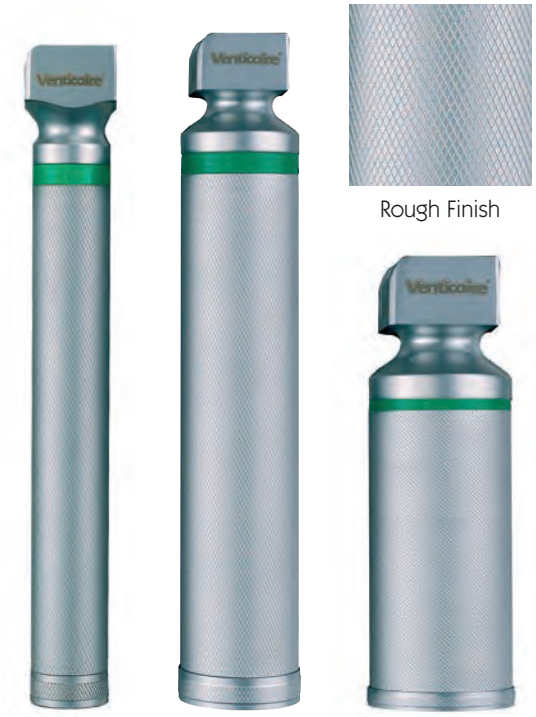
| PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|
| 040-021 | Standard Size Rough Finish | 1 |
| 040-011 | Standard Size Satin Finish | 1 |
| 040-022 | Mini Size Rough Finish | 1 |
| 040-012 | Mini Size Satin Finish | 1 |
| 040-023 | Stubby Size Rough Finish | 1 |
| 040-013 | Stubby Size Satin Finish | 1 |

| PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|
| 041-401 | Small Kryton Bulb | 1 |
| 041-402 | Standard Kryton Bulb | 1 |

| PRODUCT CODE | DESCRIPTION |
|---|---|
| 040-239 | Handle plus 3 Macintosh Blades no's 2,3 and 4 |
| 040-240 | Handle plus 3 Macintosh Blades no's 1,2 and 3 |
| 040-241 | Handle plus 4 Macintosh Blades no's 1,2 ,3 and 4 |

# Fibre Optic Handles and Box Sets

All handles are Bi-Polar, allowing the Laryngoscope to function irrespective of which way the batteries are inserted. The handles can also be opened from both ends (top and bottom) in order to remove swelled batteries with ease.



Mini Standard Stubby



Rough Finish

Mini Standard Stubby



Satin Finish

| PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|
| 040-811 | Standard Size Rough Finish | 1 |
| 040-821 | Standard Size Satin Finish | 1 |
| 040-812 | Mini Size Rough Finish | 1 |
| 040-822 | Mini Size Satin Finish | 1 |
| 040-823 | Stubby Size Rough Finish | 1 |
| 040-824 | Stubby Size Satin Finish | 1 |

| PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|
| 041-601 | Halogen Bulb | 1 |
| 041-606 | Halogen Bulb | 6 |

| PRODUCT CODE | DESCRIPTION |
|---|---|
| 040-860 | Handle plus 3 Macintosh Blades no's 1,2 and 3 |
| 040-861 | Handle plus 4 Macintosh Blades no's 1,2,3 and 4 |
| 040-862 | Handle plus 3 Macintosh Blades no's 2,3 and 4 |

# Single Patient Use Fibre Optic Blades

### Eliminate Cross Contamination Risk
Folded Blade does not touch the handle. All blades are Single patient use and individually packed

### Low Profile Design
Reduces the risk of accidental pressure or damage to the upper teeth.

### True Macintosh Curve
Provides maximum view

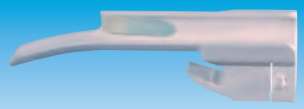
### Bright and Cool Light
No risk of accidental burning of patient or dropping of bulb

### Cost Effective
Lower than overall reusable and sterilisation costs

### Patented Hinge Design
Stops the blade from touching the handle when folded

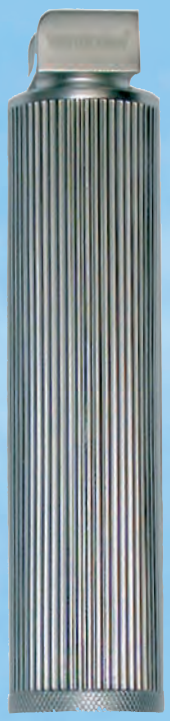
### Fits all Green Spec Handles
BS EN ISO 7376 Standard

**The folded position of the Brite Blade prevent the blade from touching the handle**

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 040-611 | Macintosh No 1 | Box of 10 |
| | 040-612 | Macintosh No 2 | Box of 10 |
| | 040-613 | Macintosh No 3 | Box of 10 |
| | 040-614 | Macintosh No 4 | Box of 10 |
|  | 040-520 | Miller 0 | Box of 10 |
| | 040-521 | Miller 1 | Box of 10 |
| | 040-522 | Miller 2 | Box of 10 |
| | | | |

Briteblades will fit all Green Spec Handles complying to BS EN ISO 7376.
For a list of handles and part numbers see page 73

# Disposable Metal Blades

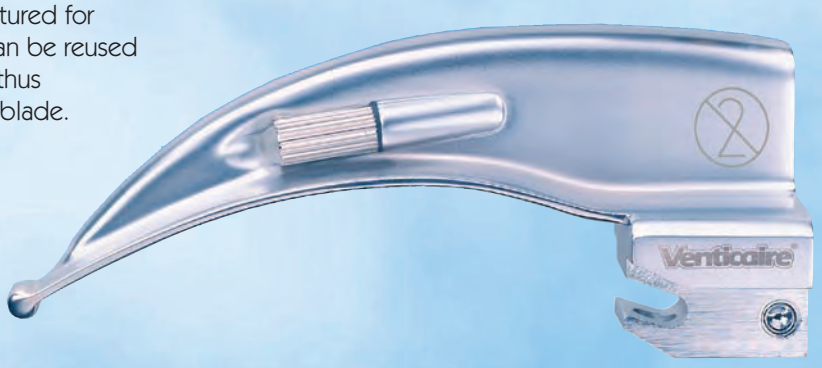


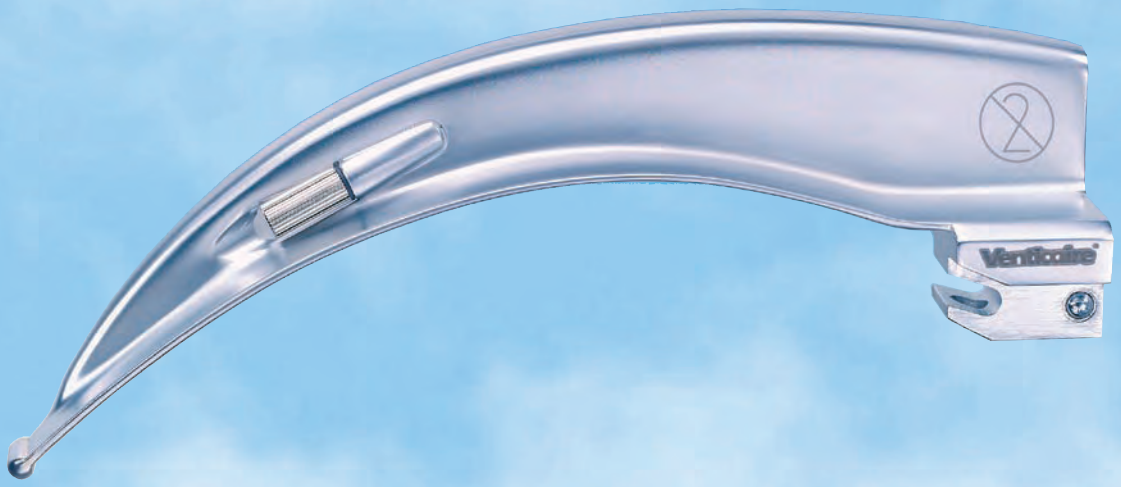
## Reduce Cross Contamination Risk

The disposable metal laryngoscope blade range is designed and manufactured for Single Patient Use. The blade can be reused for re-intubation of the patient thus eliminating the need for a new blade.

## Visible Markings

Each blade is clearly marked as Single Patient Use, avoiding the possibility of confusion with Reusable Blades.




| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 040-431 | Macintosh 1 | Box of 10 |
| | 040-432 | Macintosh 2 | Box of 10 |
| | 040-433 | Macintosh 3 | Box of 10 |
| | 040-434 | Macintosh 4 | Box of 10 |
| | 040-430 | Handle | Box of 10 |

**For total airway management with confidence**

# Recommended for Further Reading


**1** J R Hall.
"Blood contamination of equipment".
Anaesthesia and Analgesia 1994; 78: 1136-9

**2** S.J Twigg, B. McCormack & T.M.
Cook Randomised Evaluation of the Performance of Single Use Laryngoscopes in Simulated easy and difficult Intubation.
Br. J Anaesth Jan 2003;90:8-13

**3** MD Ester. L C Baines. D J Wilkinson and R M Langford.
"Decontamination of Laryngoscopes: a survey of national practice".
Anaesthesia, 1999-54


## Notes

# Endotracheal Tubes, Laryngeal Mask Airway & Nasopharyngeal Airway

# Endotracheal Tubes, Laryngeal Mask Airway & Nasopharyngeal Airway


Introduction 83

Plain Tubes (Without Cuffs) 85

VentiSeal Tubes (High Volume Low Pressure Cuffs) 86

Standard Tubes (Low Pressure Cuff) 87

LarySeal (Laryngeal Mask Airway) 88 - 93

NasoSafe (Nasopharyngeal Airway) 94 - 95

Further Reading 96

# Endotracheal Tubes

An Endotracheal Tube is a device inserted into the patient's trachea through the mouth or nose to maintain an open airway.

It is used to assist the delivery of anaesthetic gases or air to and from the patient. Control of the airway with Endotracheal tube is usually regarded as the "Gold Standard" (C. McCartney and D.J. Wilkinson, Current Anaesthesia and Critical Care 1995).

### Tracheal Intubation Objectives

1 Guarantee patency of the upper airway.

2 Protect the airway from gastric contents.

3 Allow mechanical positive pressure management.

4 Permits tracheobronchial suction.

### Anatomy and Physiology of the Respiratory System

The respiratory system can be broadly defined into the upper respiratory tract and the lower respiratory tract. The organs of the system include the nasal cavities, the pharynx, the larynx, the trachea, the bronchi and their smaller branches and the lungs which contain the terminal air sacs or alveoli.

Air inhaled through the nasal cavity is filtered by cilia. The air is also warmed and moistened by the capillary blood supply to the mucosa of the upper respiratory tract. The air then goes into the pharynx, larynx and followed by the trachea. The trachea stretches and descends during inspiration and recoils during expiration. The cartilage rings prevent it from collapsing and maintaining patency during breathing.

Air enters the right and left bronchus before reaching the bronchioles and later the alveoli, which contain capillaries where the gaseous exchange takes places.

To ensure that the lungs are being ventilated at all times and protect against potential blockages by the tip of the tube resting on the tracheal wall, all Flexicare Endotracheal Tubes have a Murphy Eye as standard. The Murphy Eye also helps to maintain flow during suctioning, and also aids in maintaining the flow of the gases to both lungs should the tube move further into one of the bronchuses.

Flexicare offer endotracheal tubes with two different cuff types

### Standard Low Pressure Cuffs

### VentiSeal High Volume Low Pressure Cuffs (HVLP)

The graph demonstrates the difference between the two types of Endotracheal tubes in relation to cuff pressure and cuff volume. The pressure necessary for the Standard Cuff to form an adequate seal increases as cuff volume increases. This happens at a higher ratio than compared with the Endosoft HVLP cuff. This characteristic determines the term of use of the respective cuffed endotracheal tubes.

The Standard Low Pressure Endotracheal Tubes are ideal for short-term intubation while the VentiSeal HVLP cuff is designed for longer term anaesthesia where cuff forms a seal without putting excess pressure on the wall of the trachea. Over inflation of a Standard Cuff and prolonged use will occlude the capillaries in the tracheal wall and will cause necrosis as shown in Figure 2.

The Murphy Eye is standard on all Venticaire Endotracheal Tubes to ensure that adequate ventilation is maintained even if the tip of the tube was fixed to the tracheal wall or occluded by secretions.

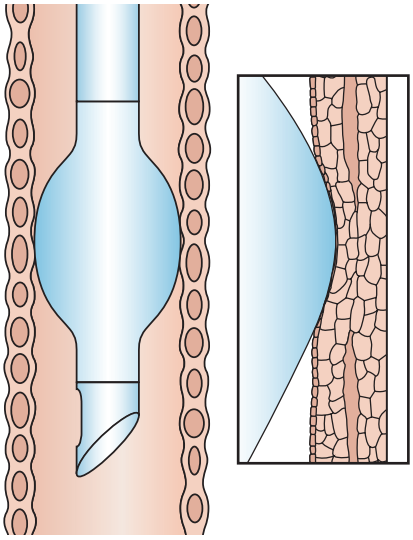


Figure 2

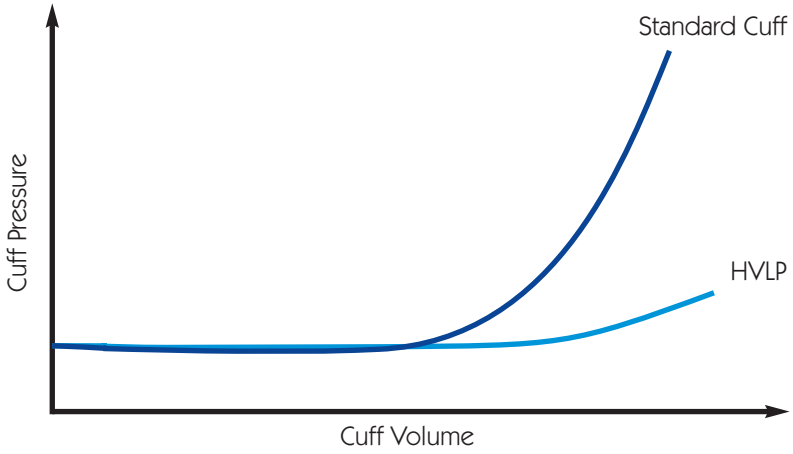



Figure 1

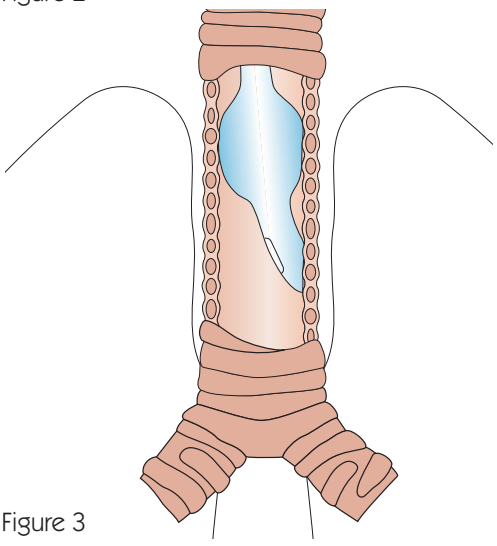


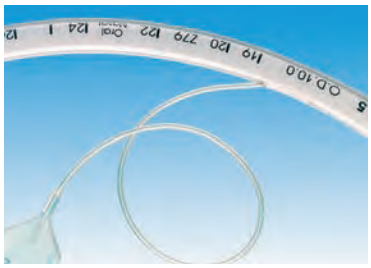
Figure 3

# Endotracheal Tubes

**Venticaire® offer a comprehensive range of Endotracheal Tubes with unique features to ensure patient's safety and comfort, allowing intubation with total confidence. Each individual tube is tested for integrity and safety.**

### Kink Resistant Thermosensitive Tube

Ensures tube patency for patient safety, whilst softening at body temperature to conform to the patient's respiratory tract.



### Kink Resistant Inflation Tube

Ensures the inflation tube remains open, hence the pilot ballon provides accurate indication of the cuff pressure.

### Smooth Bevelled Tip

Smoothly rounded bevelled tip reduces risk of damage to vocal cords during intubation and minimises contact with tracheal mucosa.

### Optimum Size Murphy Eye

The optimum size murphy eye is smoothly rounded to reduce patient trauma during intubation, whilst minimising risk of occlusion.

# Plain Tubes (Without Cuff)

### Depth Guide

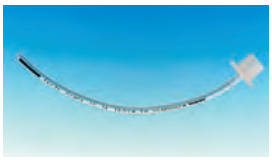
The double line guide facilitates accurate cuff placement below vocal cord.

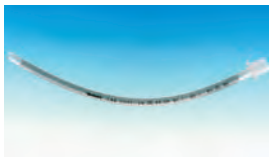
### High Resolution Radiopaque Line

Guarantees easy and accurate identification of tube position and location during x-ray.

### Pilot Ballon

The tube size, batch number and an outline of the cuff type are shown on the pilot ballon to provide easy identification.





| SIZE LD (MM) | ORAL/NASAL | CURVED (ORAL) SOUTH | CURVED (NASAL) NORTH | REINFORCED |
|---|---|---|---|---|
| 2.5 | 038-961-025 | - | - | - |
| 3.0 | 038-961-030 | - | 038-964-030 | 038-965-030 |
| 3.5 | 038-961-035 | - | 038-964-035 | 038-965-035 |
| 4.0 | 038-961-040 | - | 038-964-040 | 038-965-040 |
| 4.5 | 038-961-045 | - | 038-964-045 | 038-965-045 |
| 5.0 | 038-961-050 | 038-962-050 | 038-964-050 | 038-965-050 |
| 5.5 | 038-961-055 | 038-962-055 | 038-964-055 | 038-965-055 |
| 6.0 | 038-961-060 | 038-962-060 | 038-964-060 | 038-965-060 |
| 6.5 | 038-961-065 | 038-962-065 | 038-964-065 | 038-965-065 |
| 7.0 | 038-961-070 | 038-962-070 | 038-964-070 | 038-965-070 |
| 7.5 | 038-961-075 | 038-962-075 | - | 038-965-075 |
| 8.0 | 038-961-080 | 038-962-080 | - | 038-965-080 |
| 8.5 | 038-961-085 | 038-962-085 | - | 038-965-085 |
| 9.0 | 038-961-090 | 038-962-090 | - | 038-965-090 |
| 9.5 | 038-961-095 | - | - | - |
| 10.0 | 038-961-100 | - | - | - |
| 10.5 | 038-961-105 | - | - | - |
| 11.0 | 038-961-110 | - | - | - |

# VentiSeal™ Tracheal Tubes

## Reduced Risk of Vocal Injury and Trachea Necrosis

An optimum volume cuff with ideal pressure distribution and effective sealing. The smaller thin wall cuff reduces abrasive creases and folds. The ultra-smooth material permits gentle conformity to tracheal contours.

The diagram demonstrates the difference between the surface area that is in contact with the trachea when using an VentiSeal Cuffed Tube and a competitor tube. The cuff length of the VentiSeal Endotracheal Tube enables the pressure to be distributed over a larger surface thus minimising the pressure placed on the tracheal wall and reducing the risk of trachael wall necrosis Figure 1.

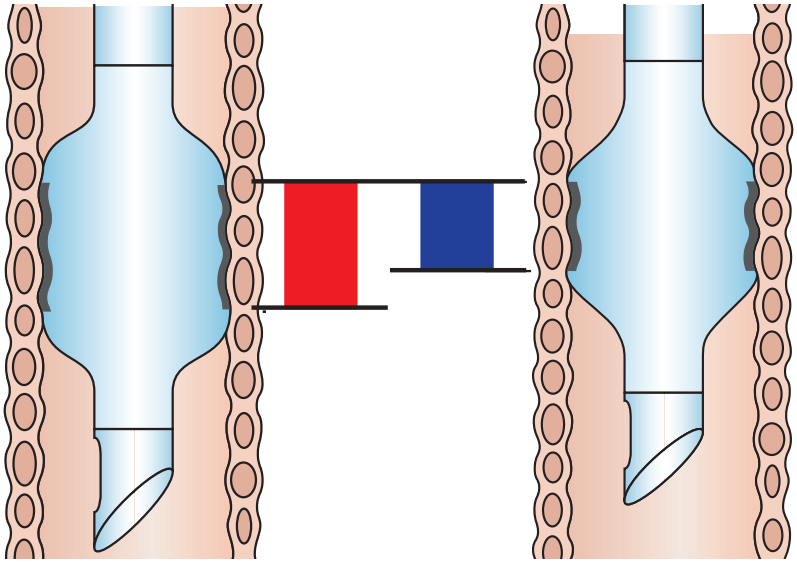
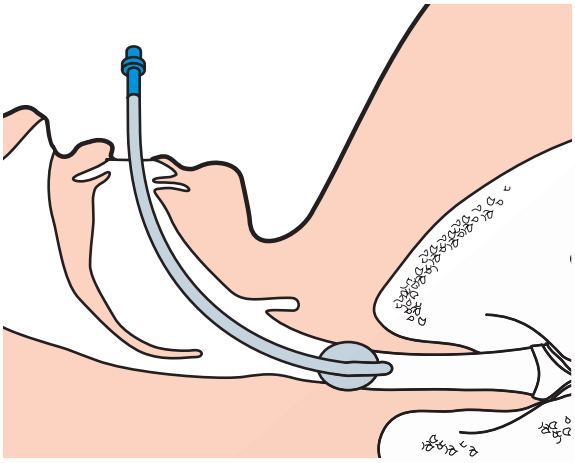


Figure 1

| SIZE ID (MM) | ORAL/NASAL | CURVED (ORAL) SOUTH | ANATOMICAL (ORAL) | CURVED (NASAL) NORTH | REINFORCED |
|---|---|---|---|---|---|
| 2.5 | 038-971-025 | - | - | - | - |
| 3.0 | 038-971-030 | - | - | - | - |
| 4.0 | 038-971-040 | - | - | - | - |
| 4.5 | 038-971-045 | - | - | - | - |
| 5.0 | 038-971-050 | 038-972-050 | - | - | - |
| 5.5 | 038-971-055 | 038-972-055 | - | - | - |
| 6.0 | 038-971-060 | 038-972-060 | 038-973-060 | 038-974-060 | 038-975-060 |
| 6.5 | 038-971-065 | 038-972-065 | 038-973-065 | 038-974-065 | 038-975-065 |
| 7.0 | 038-971-070 | 038-972-070 | 038-973-070 | 038-974-070 | 038-975-070 |
| 7.5 | 038-971-075 | 038-972-075 | 038-973-075 | 038-974-075 | 038-975-075 |
| 8.0 | 038-971-080 | 038-972-080 | 038-973-080 | 038-974-080 | 038-975-080 |
| 8.5 | 038-971-085 | 038-972-085 | 038-973-085 | - | 038-975-085 |
| 9.0 | 038-971-090 | 038-972-090 | 038-973-090 | - | 038-975-090 |
| 9.5 | 038-971-095 | - | - | - | - |
| 10.0 | 038-971-100 | - | - | - | - |
| 10.5 | 038-971-105 | - | - | - | - |
| 11.0 | 038-971-110 | - | - | - | - |

# Standard (Low Pressure Cuff)



The Standard Range of Low Pressure Endotracheal tubes are designed for short-term intubation.

The cuff size and shape make the Standard Low Pressure Endotracheal tube ideal for emergency intubation, as the slim line shape facilitates easy and quick intubation to maintain an open airway.

| SIZE ID (MM) | ORAL/NASAL | CURVED (ORAL) | CURVED (NASAL) |
|---|---|---|---|
| 5.0 | 038-981-050 | 038-982-050 | 038-984-050 |
| 5.5 | 038-981-055 | 038-982-055 | 038-984-055 |
| 6.0 | 038-981-060 | 038-982-060 | 038-984-060 |
| 6.5 | 038-981-065 | 038-982-065 | 038-984-065 |
| 7.0 | 038-981-070 | 038-982-070 | 038-984-070 |
| 7.5 | 038-981-075 | 038-982-075 | 038-984-075 |
| 8.0 | 038-981-080 | 038-982-080 | 038-984-080 |
| 8.5 | 038-981-085 | 038-982-085 | - |
| 9.0 | 038-981-090 | 038-982-090 | - |
| 9.5 | 038-981-095 | - | - |
| 10.0 | 038-981-100 | - | - |
| 10.5 | 038-981-105 | - | - |
| 11.0 | 038-981-110 | - | - |

# Laryngeal Mask Airway

## Reduced risk of blockage and turbulence, Ease of use for endoscopy

Anatomically shaped patient port allows for better flow with lower resistance. The deep design of this port reduces the risk of blockages by soft tissues. The open patient end port allows the use of endoscope without restriction.

## Printed info on the main tube

Guidance for air volume and size printed on the main tube.

## Readily available in 6 colour coded sizes

Products are readily available in 6 sizes from size 1 to 5, and have colour coded pilot balloons for ease of identification.



## Full Glottis view

The supraglottic airway device allows for a clear view of the glottis using an endoscope.

## Clearly labelled packaging

Instructions for use are clearly shown on the easy opening packaging.

**For total airway management with confidence**

# Laryngeal Mask Airway

## Laryngeal Mask Airway Colour Coding

All of the LarySeal range has a colour coded pilot balloon which corresponds to the size of the Laryngeal Mask Airways, providing a clear visual indication of the size, therefore facilitating quicker selection.

### THE LARYSEAL PILOT BALLOON COLOUR CODING SYSTEM

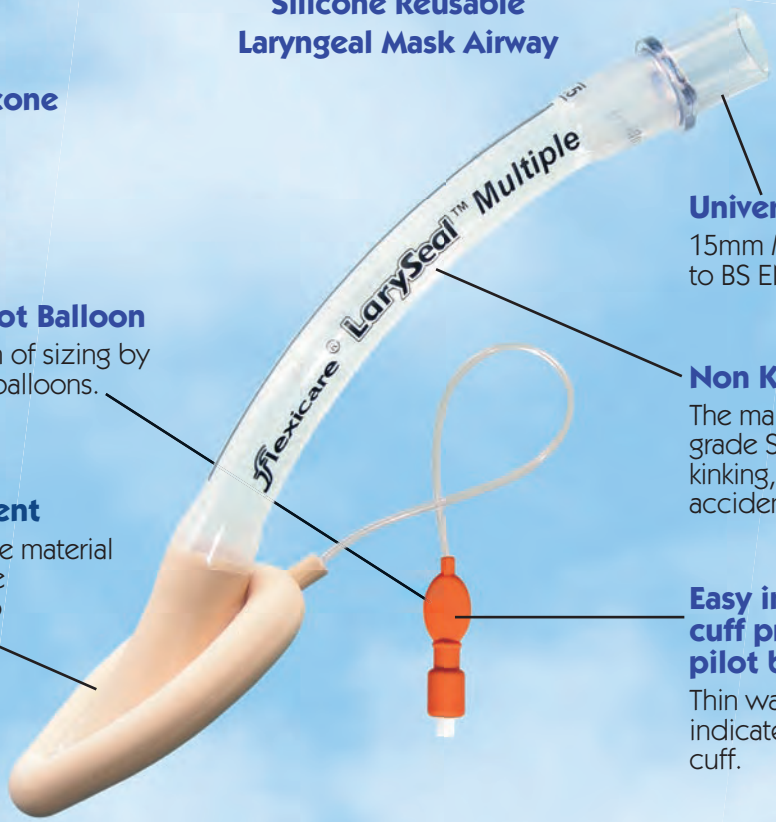
| | | | | |
|---|---|---|---|---|
| | White Pilot Balloon - size 1 | Air | < 4ml/60cm $H_2O$ | Size 1<br>< 5Kg |
| | Light Green Pilot Balloon - size 2 | Air | < 10ml/60cm $H_2O$ | Size 2<br>10Kg - 20Kg |
| | Green Pilot Balloon - size 2.5 | Air | < 14ml/60cm $H_2O$ | Size 2.5<br>20Kg - 30Kg |
| | Orange Pilot Balloon - size 3 | Air | < 20ml/60cm $H_2O$ | Size 3<br>30Kg - 50Kg |
| | Red Pilot Balloon - size 4 | Air | < 30ml/60cm $H_2O$ | Size 4<br>50Kg - 70Kg |
| | Yellow Pilot Balloon - size 5 | Air | < 40ml/60cm $H_2O$ | Size 5<br>70Kg - 100Kg |

**For total airway management with confidence**

# LarySeal™ Multiple

## Silicone Reusable Laryngeal Mask Airway

- High Quality Silicone
- Autoclavable
- Easy to Purchase




### Universal Connection
15mm M connector complies to BS EN ISO 5356 standard.

### Colour Coded Pilot Balloon
Ease of identification of sizing by colour coded pilot balloons.

### Non Kinking Main Tube
The main tube wall is of high grade Silicone. While resisting kinking, it is more secure for accidental patient bite.

### Secure Seal for Airway Management
Highly Elastic Silicone material allows the cuff of the mask to form itself to the contour of the oropharyngeal area and provide a secure seal.

### Easy indication of the cuff pressure through pilot balloon
Thin wall pilot balloon indicates the inflation of the cuff.

### Autoclavable, Reusable
Durable high temperature resistant material.
Recommended for up to 40 times autoclaving.

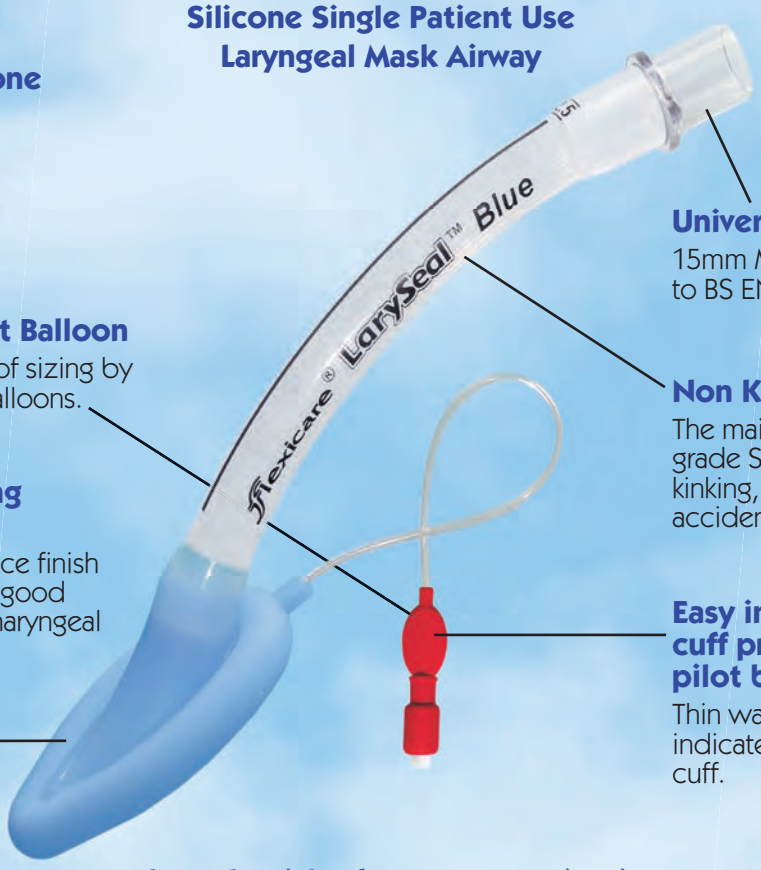
| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 038-94-110 | Laryseal Multiple size 1 | 10 |
| | 038-94-120 | Laryseal Multiple size 2 | 10 |
| | 038-94-125 | Laryseal Multiple size 2.5 | 10 |
| | 038-94-130 | Laryseal Multiple size 3 | 10 |
| | 038-94-140 | Laryseal Multiple size 4 | 10 |
| | 038-94-150 | Laryseal Multiple size 5 | 10 |

**For total airway management with confidence**

# LarySeal™ Blue

## Silicone Single Patient Use Laryngeal Mask Airway

- High Quality Silicone
- Single Use
- Cost Effective
- Easy to Purchase




### Universal Connection
15mm M connector complies to BS EN ISO 5356 standard.

### Non Kinking Main Tube
The main tube wall is of high grade Silicone. While resisting kinking, it is more secure for accidental patient bite.

### Colour Coded Pilot Balloon
Ease of identification of sizing by colour coded pilot balloons.

### Less risk of slipping or dislocation
The silicone matt surface finish of the cuff provides a good adhesion to the oropharyngeal area and reduces the risk of movement and dislocation of the cuff.

### Easy indication of the cuff pressure through pilot balloon
Thin wall pilot balloon indicates the inflation of the cuff.

### Reduce the risk of cross contamination
Sterile product in secure packaging.

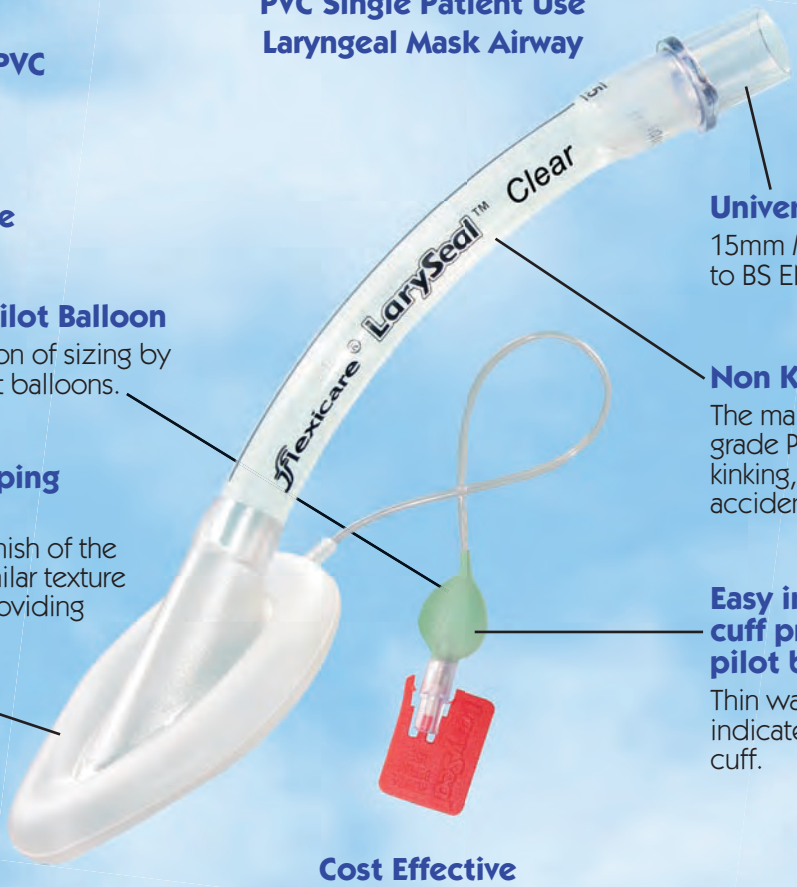
| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 038-94-210 | Laryseal Blue size 1 | 10 |
| | 038-94-220 | Laryseal Blue size 2 | 10 |
| | 038-94-225 | Laryseal Blue size 2.5 | 10 |
| | 038-94-230 | Laryseal Blue size 3 | 10 |
| | 038-94-240 | Laryseal Blue size 4 | 10 |
| | 038-94-250 | Laryseal Blue size 5 | 10 |

**For total airway management with confidence**

# LarySeal™ Clear

**PVC Single Patient Use Laryngeal Mask Airway**

- **Medical Grade PVC**
- **Single Use**
- **Cost Effective**
- **Easy to Purchase**




**Universal Connection**
15mm M connector complies to BS EN ISO 5356 standard.

**Colour Coded Pilot Balloon**
Ease of identification of sizing by colour coded pilot balloons.

**Non Kinking Main Tube**
The main tube wall is of high grade PVC. While resisting kinking, it is more secure for accidental patient bite.

**Less risk of slipping or dislocation**
The satin surface finish of the cuff provides a similar texture to silicone, thus providing ease of insertion while providing a secure seal.

**Easy indication of the cuff pressure through pilot balloon**
Thin wall pilot balloon indicates the inflation of the cuff.

**Cost Effective**
Eliminate the need for the costly and time consuming process of cleaning and re-sterilising.

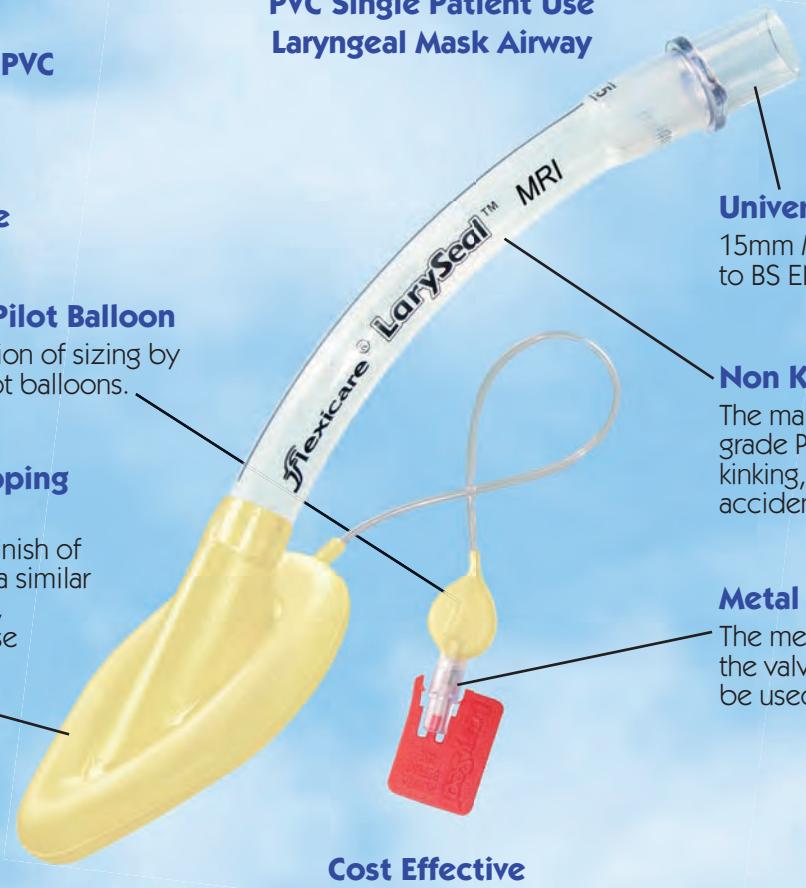
| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 038-94-310 | Laryseal Clear size 1 | 10 |
| | 038-94-320 | Laryseal Clear size 2 | 10 |
| | 038-94-325 | Laryseal Clear size 2.5 | 10 |
| | 038-94-330 | Laryseal Clear size 3 | 10 |
| | 038-94-340 | Laryseal Clear size 4 | 10 |
| | 038-94-350 | Laryseal Clear size 5 | 10 |

**For total airway management with confidence**

# LarySeal™ MRI

**PVC Single Patient Use Laryngeal Mask Airway**

- **Medical Grade PVC**
- **Single Use**
- **Cost Effective**
- **MRI Compatible**




**Universal Connection**
15mm M connector complies to BS EN ISO 5356 standard.

**Colour Coded Pilot Balloon**
Ease of identification of sizing by colour coded pilot balloons.

**Non Kinking Main Tube**
The main tube wall is of high grade PVC. While resisting kinking, it is more secure for accidental patient bite.

**Less risk of slipping or dislocation**
The satin surface finish of the cuff provides a similar texture to silicone, thus providing ease of insertion while providing a secure seal.

**Metal Free Inflation Valve**
The metal free construction of the valve allows the LarySeal to be used in MRI

**Cost Effective**
Eliminate the need for the costly and time consuming process of cleaning and re-sterilising.

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 038-94-410 | Laryseal MRI size 1 | 10 |
| | 038-94-420 | Laryseal MRI size 2 | 10 |
| | 038-94-425 | Laryseal MRI size 2.5 | 10 |
| | 038-94-430 | Laryseal MRI size 3 | 10 |
| | 038-94-440 | Laryseal MRI size 4 | 10 |
| | 038-94-450 | Laryseal MRI size 5 | 10 |

# NasoSafe®

**NasoSafe is a new and innovative Nasopharyngeal Airway. The swivel safety grip eliminates the risk of the airway from travelling down the nasal passage while providing the maximum comfort for the patient.**

## Swivel Safety Grip

The NasoSafe swivel grip protects the Nasopharyngeal airway from loss in the nasal passage. The swivel grip allows for positioning of the airway in the most comfortable position.

## Reduced Risk of Injury During Intubations

The rounded edge of the tip combined with angle cut design helps to reduce the risk of injury during intubation.

## Size Colour Coding

The swivel safety grip is colour coded to match suction catheter size colour coding.

## Patient Comfort

The swivel safety grip can be positioned so that it does not block the free nostril.

## Reduced Risk of Patient Reaction

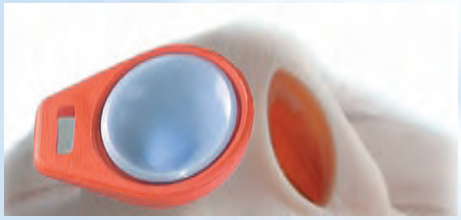
NasoSafe is made of medical grade PVC and is implant tested.

- **Better tolerated by patients than oropharyngeal airways**
- **Ideal when oral passage not accessible**
- **Allows access for nasotracheal suctioning**
- **Swivel grip provides maximum patient comfort and safety**
- **Size Colour Coded to match suction catheter colour coding**

# Nasopharyngeal Airway

NasoSafe® is best inserted when the patient is in the supine position. The airway should be lubricated with a water soluble lubricant prior to insertion. The rounded bevelled tip reduces mucusal wall trauma and guides the airway along the floor of the nasal passage. When correctly in place the tip of the airway should be visible behind the uvula.

NasoSafe® has a patented safety grip that can be rotated through 360° to place the airway in the most convenient position without blocking the free nostril. The extended lip of the safety grip prevents the airway being sucked in while in situ.



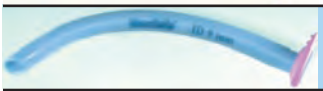
**Right Nostril Position**

**Left Nostril Position**

NasoSafe®

NasoSafe® is available in 4 sizes with colour coded swivel safety grips to coordinate with suction catheter sizes.

**6.0mm ID** **7.0mm ID** **8.0mm ID** **9.0mm ID**

| | PRODUCT CODE | DESCRIPTION | BOX SIZE |
|---|---|---|---|
| | 038-95-006 | 6.0 mm ID (Green) | 10 |
| | 038-95-007 | 7.0 mm ID (Orange) | 10 |
| | 038-95-008 | 8.0 mm ID (Red) | 10 |
|  | 038-95-009 | 9.0 mm ID (Purple) | 10 |

Patent No GB2391812

# Recommended for Further Reading


**1** Scheidegger D.
Tutorial on emergency medicine and trauma. Emergency aspects of difficult airway management in ARDS. The "difficult" intubation @ tips and tricks. Program and abstracts of the 15th Annual Congress of the European Society of Intensive Care Medicine; September 29-October 2, 2002. Barcelona. Spain.

**2** Fisher MM, Raper RF.
The 'cuff-leak' test for extubation.
Anaesthesia 1992;47(1):10-12

**3** Gmec.S.
Comparison of three different methods to confirm tracheal tube placement in emergency intubation.
Intensive Care Med. 2002:28.701 - 704

**4** Salem MR.
Verification of endotracheal tube position.
Anesthesiol Clin North Am. 2001: 2001; 19:813-839

**5** de lassence A, Alberti C, Azoulay E, et al.
Impact of unplanned extubation and reintubation after weaning on nosocomial pneumonia risk in the intensive care unit; a prospective multicenter study,
Anesthesiology. 2002; 97:148-156

**6** Shapiro M, Wilson RK, Casar G, Bloom K, Teague RB.
Work of breathing Through different sized endotracheal tubes.
Crit Care Med 1986, 14:1028-1031 (PubMed Abstract)

**7** Christie JM Dethlefsen M, Cane RD.
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J Clin Anesth. 1996 8.289-293

**8** Cohen I, Weinberg PF, Fein A, Rowinski GS.
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Crit Care Med 1988,16:277-279

**9** Stauffer JL, Silvestri RE.
Complications of endotracheal Intubation, tracheostomy, and artificial airways.
Respir Care 1982,27.417-434

**10** Extubation criteria after weaning from intermittent mandatory ventilation and continuous positive airway pressure.
Crit Care Med 1983;11(9):702-707

**11** Use of Laryngeal Mask Airway in Children with Upper Respiratory Tract Infections: A Comparison with Endotintubation
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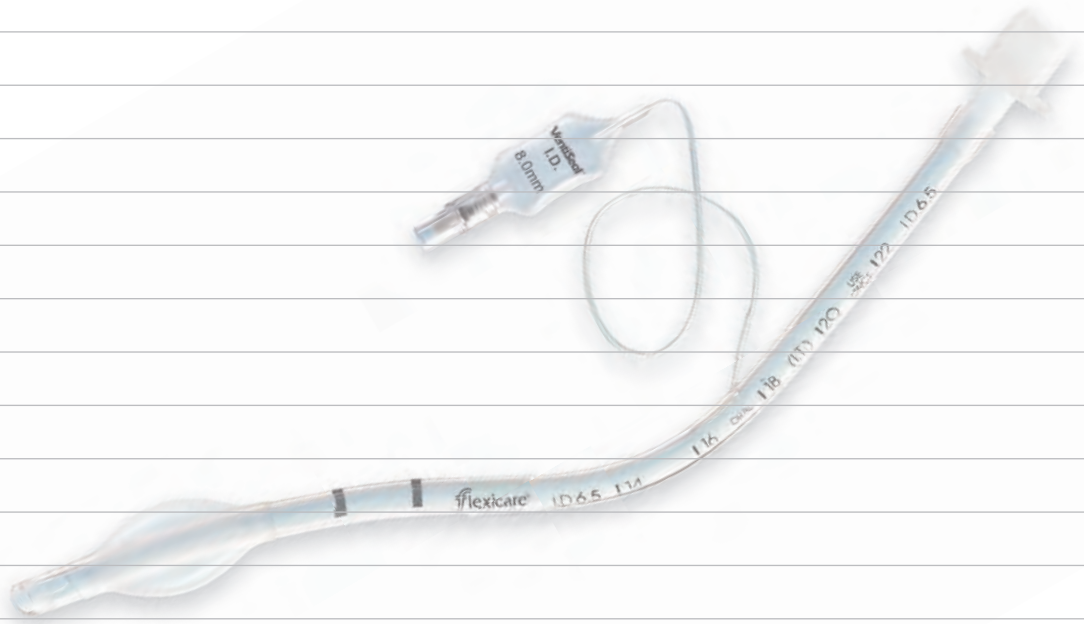
Anesthesiology, 1996;85:1341-9


## Notes



# Resuscitation

## Bag - Valve - Mask

# Resuscitation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Resuscitation Bags (Single Patient Use) 102

Resuscitation Bags (Silicone Reusable) 103

Resuscitation Mask (Pocket Mask) 104

# Introduction

### Advanced Airway Management

Flexicare Medical Limited are dedicated to continually developing and providing high quality, disposable airway management equipment to aid trained Health Care Professionals in Resuscitation Practice.

Advanced, effective airway management will ventilate the patient's lungs providing the highest possible oxygen concentration levels – aiming for 100%.

Bag-Valve-Masks are frequently utilised for effective airway management as an alternative to tracheal intubation.

Flexicare offer a full range of single patient use and reusable resuscitator bags in three sizes of Adult, Paediatric & Neonatal. All products are latex free and are supplied complete with mask, reservoir bag and star lumen oxygen tube ready to use in a sealed polyethylene bag with easy tear-off opening. This will save valuable time in emergencies and critical situations.

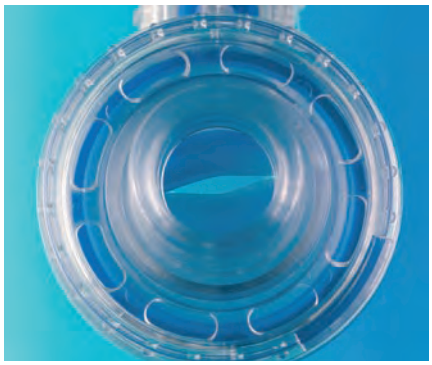
### Oropharyngeal Airways (Guedel)

These may be used as an adjunct to Bag-Valve-Masks on unconscious patient's in order to depress the tongue and establish and maintain the patency of the upper airway. Venticaire offer a full range of Oropharyngeal Airways in sizes 000 through to Adult Size 4.

(See page 62)

# Protect Patients against Cross Contamination with the Venticaire Single Patient Use Resuscitator Bag

**The Venticaire Single Use Resuscitator Bag is designed for manual ventilation of patients. The ready to use pack allows for speed and efficiency that is required especially during the early critical stages of CPR.**



## Reduced Risk of Patient Rebreathing

The integrated duck bill design of the non-return valve prevents patient's exhaled gases to enter the resuscitator bag, providing one way flow of fresh gas from the bag to the patient.

## Eliminate Lung Over Inflation

The Pressure Relief Valve supplied with all bags opens at 60cm $H_2O$ for adults. The paediatric and neonatal valve opens at 40±5 cm of $H_2O$. The pressure Relief Valve can be locked when increased pressure is required. The adult size is also available without a pressure relief valve.

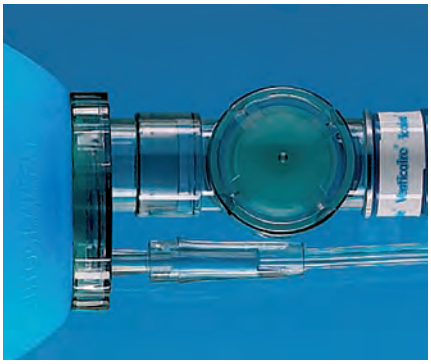
## User Mobility

An integrated Double Swivel Connector allows the Resuscitator bag to be rotated fully through 360° without the need to stop bagging the patient and providing most convenient position for the resuscitator.

# Resuscitators

## Positive Grip

The outer textured surface of the Resuscitator Bags provide a positive grip during resuscitation. The design of the bags allow for ease of manual ventilation with least resistance and minimal hand fatigue.



## Supplementary Oxygen

The bags can be connected to an oxygen source to deliver supplemental oxygen. Oxygen concentration is dependant on flow rate, frequency and tidal volume delivered to the patient.

## Space Saving Design

The Adult Resuscitator is supplied fully assembled in a collapsible space saving format, which is easily and quickly extendible for patient use.

| | Adult | Paediatric | Neonatal |
|---|---|---|---|
| Dead Space (Mask + Valve) | 168ml | 113ml | 46ml |
| Pressure Relief Valve | 60 ± 10 cm H2O | 40 ± 5 cm H2O | 40 ± 5 cm H2O |
| Resuscitator Bag Volume | 1500ml | 550ml | 280ml |
| Oxygen Reservoir Bag Volume | 2500ml | 2500ml | 600ml |
| Stroke Volume | 800ml (one hand)<br>1350ml (two hands) | 350ml | 100ml |
| Maximum Breath per Minute (BPM) | 45 BPM | 105 BPM | 98 BPM |
| Mask Size | 5 | 3 | 1 |
| Oxygen Tube | 3.0m Star Lumen Tubing | 3.0m Star Lumen Tubing | 3.0m Star Lumen Tubing |

**For total airway management with confidence**

# Single Patient Use Resuscitator Bags

| | PRODUCT CODE | DESCRIPTION | BOX SIZE |
|---|---|---|---|
| | 038-71-840 | Adult Single Patient Use Resuscitator Bag with Mask, Oxygen Line and Reservoir Bag | 5 |
| | 038-71-841 | Adult Single Patient Use Resuscitator Bag with Mask, Oxygen Line and Reservoir Bag without a pressure relief valve | 5 |
| | 038-72-840 | Paediatric Single Patient Use Resuscitator Bag with Mask, Oxygen Line and Reservoir Bag | 5 |
| | 038-73-840 | Neonatal Single Patient Use Resuscitator Bag with Mask, Oxygen Line and Reservoir Bag | 5 |
| | 038-71-845 | Resuscitaton Pack<br>Adult, Paediatric and Neonatal Single Patient Use Resuscitator Bag with Masks, Oxygen Lines and Reservoir Bags | 1 Set |

# Silicone Reusable Resuscitator Bags

| | PRODUCT CODE | DESCRIPTION | BOX SIZE |
|---|---|---|---|
| | 038-71-850 | Adult Silicone Reusable Resuscitator Bag with Mask, Oxygen Line and Reservoir Bag | 5 |
| | 038-71-851 | Adult Silicone Reusable Resuscitator Bag with Mask, Oxygen Line and Reservoir Bag without a pressure relief valve | 5 |
| | 038-72-850 | Paediatric Silicone Reusable Resuscitator Bag with Mask, Oxygen Line and Reservoir Bag | 5 |
| | 038-73-850 | Neonatal Silicone Reusable Resuscitator Bag with Mask, Oxygen Line and Reservoir Bag | 5 |
| | 038-71-855 | Resuscitaton Pack<br>Adult, Paediatric and Neonatal Silicone Reusable Resuscitator Bag with Masks, Oxygen Lines and Reservoir Bags | 1 Set |
| | 038-71-857 | Reservoir Bag and $O_2$ line for Adult, Paediatric Silicone Resuscitators | Box of 10 |
| | 038-73-857 | Reservoir Bag and $O_2$ line for Neonatal Silicone Resuscitators | Box of 10 |

**For total airway management with confidence**

Venticaire®

# Protect Patients against Cross Contamination with the Venticaire Single Patient Use Resuscitator Mask

- **Pre-filled cushion**
  Providing maximum seal
- **Non-return valve**
  Prevents reflux contamination whilst allowing gas escape through side vents
- **Built in $O_2$ line port with cap**
  Allows connection of $O_2$ if required - no need to change mask during transportation
- **Integral Bacterial/Viral Filter**
  Protecting both patient and resuscitator
- **Latex free strap**
  Assists in maintaining mask in secure position - eliminates risk of Latex reaction
- **Secure durable carrying case**
  Mask carefully protected until required - easy open release catch with printed easy-to-follow instructions

| | PRODUCT CODE | DESCRIPTION | BOX SIZE |
|---|---|---|---|
| | 010-999 | First Aid Mask | Box of 20 |

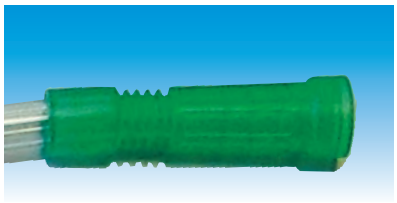
**For total airway management with confidence**

# Suction Tubing

# Sterile Suction Tubing

## Clear Non-Coiling PVC

The wall thickness prevents the tube from collapsing when the tube is used under high negative pressure.



## Universal Female Connector

The rib design elastomeric connectors provide secure connection to adaptors and catheters. Connectors are colour coded for ID size.
**Yellow** = 7mm **Green** = 6mm **Blue** = 5mm.

## Spare Male - Male Connector

All sterile suction connecting tubes are supplied with one spare Male-Male connector for connection to Female connectors in the suction catheters or for connecting two tubes should extended length be required.

## Peel Pouch Sterile Packing

All sterile suction connecting tubes are supplied in double wrap, non stick inner bag and outer easy to open peel pouch.

## Suction Bubble Tube

The suction bubble tube is available in 5 and 7 mm ID with 1 metre bubble repeat. The product is supplied in a 30 metre coil dispensing box.

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
| | 1020-25 | 7mm ID Suction Tube Sterile 2Metres with F/F connector | 25 |
| | 1020-6 | 6mm ID Suction Tube Sterile 2Metres with F/F connector | 25 |
| | 1024-25 | 7mm ID Suction Tube Sterile 2.4Metres with F/F connector | 25 |
| | 1027-25 | 7mm ID Suction Tube Sterile 2.7Metres with F/F connector | 25 |
| | 1030-25 | 7mm ID Suction Tube Sterile 3Metres with F/F connector | 25 |
| | 1030-5 | 5mm ID Suction Tube Sterile 3Metres with F/F connector | 25 |
| | 1030-6 | 6mm ID Suction Tube Sterile 3Metres with F/F connector | 25 |
| | 1035-25 | 7mm ID Suction Tube Sterile 3.5Metres with F/F connector | 25 |
| | 1037-25 | 7mm ID Suction Tube Sterile 3.7Metres with F/F connector | 25 |
| | 10830-5 | Suction tube 30m coil 5mm ID with bubble non conductive | 1 roll |
| | 10830-7 | Suction tube 30m coil 7mm ID with bubble non conductive | 1 roll |

# Continence Care

## Urine Drainage Bags & Accessories

# Continence Care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# Introduction

Incontinence can affect many people of various age groups from children to the elderly, male or female, the disabled as well as the able. Statistics show that approximately 1 in 15 people suffer from incontinence, with 1 in 4 women experiencing incontinence during some part of their life as well as 1 in 10 men.

There are several classifications of incontinence:

### Stress Incontinence

This is when there is a leakage of urine usually associated with women during or after pregnancy, due to the pelvic floor muscles, which support the pelvic organs being stretched or/and weakened. It can also occur during a laugh, cough, sneeze or vigorous exercise such as running. Men can also experience stress incontinence post prostrate operations.

### Urge Incontinence

This is when the individual experiences a sudden need to empty the bladder but without sufficient notice to reach a toilet in time.

### Overflow Incontinence

This is when the bladder remains full and does not empty properly and can be accompanied by constant dribbling and poor flow. It is most commonly seen in men with an enlarged prostate gland or with some restriction to the flow of urine from the bladder.

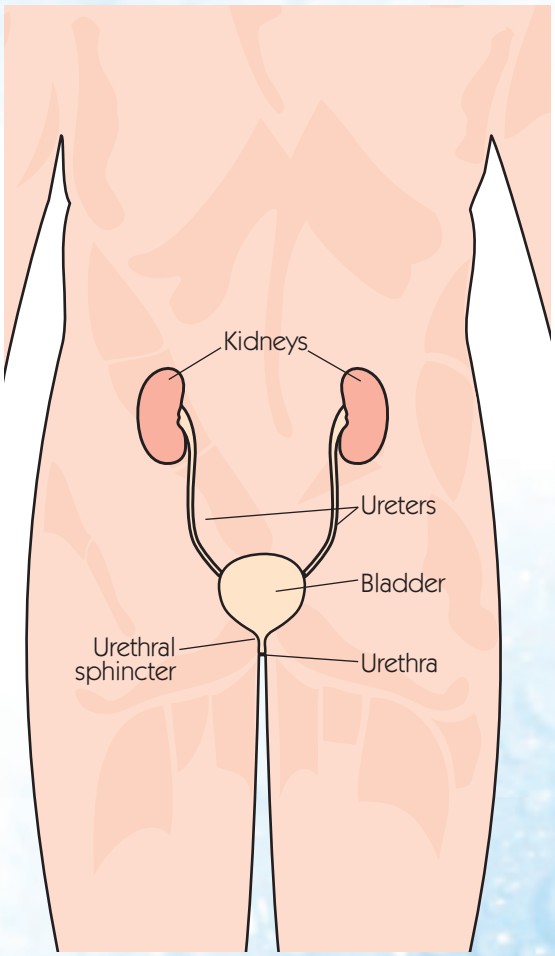
### The Urinary System

The basic principle of the urinary system is to remove unwanted elements from the body. The initial stage of the process begins with the Kidneys.

The Kidneys act as the body's filtration system by taking the blood and removing the waste products, transforming it into urine. This is then transported by the Ureters from the kidneys to the Bladder where the urine is then stored.

Surrounding the bladder is the detrusor muscle which is covered by millions of nerve endings. These nerve endings send messages to the brain when the bladder is full and thus needs to be emptied. The bladder can hold between 400 – 600ml of urine when full and after voiding there is still 200 – 300ml retained in the bladder.

When emptying of the bladder begins the urethral sphincter opens




to allow the passage of urine down the urethra and finally leaving the body. Micturition for the average person occurs between four to seven times a-day, however, this can vary between individuals.

While some incontinence problems can be cured, there are still a large number of people affected by an underlying disorder. The use of foley catheters, catheter valves, leg bags and night bags can aid individuals in participating in the social arena without the undue worry of incontinence.

Flexicare offer a wide range of Leg Bags and Night Drainage Bags to meet individual patient requirements so that they may continue with their normal daily activities. The Urine Bags have been designed and manufactured with every user's requirements taken into consideration, achieving a high level of user confidence and comfort.

# Continence Products

Flexicare® urine bags have been designed and manufactured with every user's requirements taken into consideration. Achieving a high level of users' confidence and comfort is a fundamental criteria in the making of Flexicare's range of Urology products. All Flexicare® bags are made and tested to meet International Standards (BS EN ISO. 8669)

Flexicare leg bags give you the choice of 350ml, 500ml and 750ml capacity. All three leg bag capacities are available in short and long tube lengths and for those requiring that little bit extra our 60cm length adjustable length tube should fit the bill.

2 Litre bedside Bags are available with and without tap.

## Secure Attachment To Catheter and Sheath

The conical shaped smooth surfaced connector glides easily into both catheter and sheath providing a secure connection that will withstand the most vigorous user activity. The absence of ridges in the connector reduces the risk of contamination when disconnecting, a problem frequently experienced with ridged connectors.

## Reduced Risk of Needle Stick Injury

The carefully designed shrouded sample port reduces the risk of needle stick injury while aiding the accurate introduction of the needle during sampling.

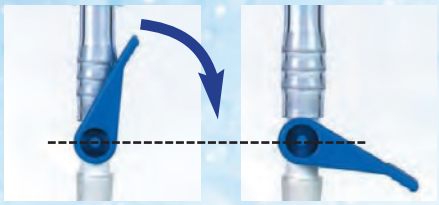
## Free and Rapid Flow

The satin finished wide bore drainage tubing allows for the unimpeded flow of urine, optimising drainage and providing observation of urinary flow at a glance. The tubing is both firm and flexible affording comfort to the user.

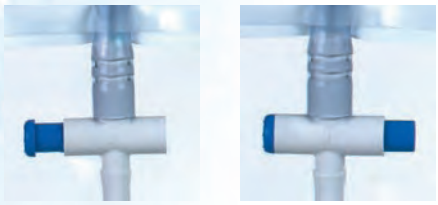
## Easy to Operate Leak Free Taps

Both the Lever Tap and T-Tap fitted to Flexicare bags are 100% leak tested, and are easy to operate. The Lever Tap requires a lower force to open and close the tap and this design is preferred by the elderly where dexterity may be impaired.

180° lever tap



90° lever tap



T tap

## Safe and Secure Drainage

The unique design and manufacture of our non-return (NRV) valves allows low pressure drainage without compromising its anti reflux property, a balance required to allow free flow of urine into the bag and at the same time protect the patient against potential ascending infection.

## Maximum Comfort

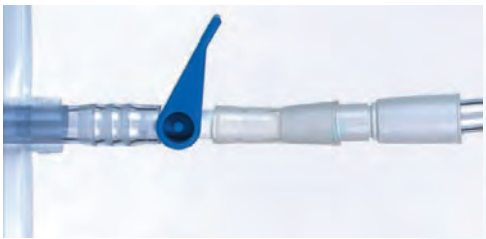
All of our community leg bags have a durable, skin friendly non woven fabric backing to reduce skin irritation and perspiration, conditions often associated with non fabric backed leg bags.

## Secure and Comfortable Fit

Anti slip latex free Lycra Velcro straps provide secure comfortable support and help maintain the inlet tube and NRV in position, preventing kinking of the tube or folding of the NRV. A situation that can lead to backflow often associated with bladder irritability and subsequent catheter or sheath separation.

## Universal Secure Over Night Connection

The silicone overnight connection fitted to outlet taps of Flexicare leg bags provide a secure and reliable connection to a bedside night drainage bag.



## Optional Tube Lengths

The table below shows the different tube lengths available.

| TUBE DESCRIPTION | TUBE LENGTH |
|---|---|
| Short Tube | 7cm / 2 ¾ inches |
| Long Tube | 30cm / 11 ¾ inches |
| Extra Long Adjustable Tube | 60cm / 23 ¾ inches |
| All 2 Litre Bags | 100cm / 29 ½ inches |

# Drainable Non-Drainable 2L Bag
# Twist and Snap

F2-EZ is an innovative 2L drainage bag designed for easy opening and controlled drainage of fluids. The twist and snap connector is located at the top of the bag thus eliminating the possibility of splash, spray and cross contamination associated with other tear bags and bottom located tap single use bags.

### F2-EZ Twist and Snap Connector

Innovative easy to open angled connector with wide bore for rapid drainage.

### Opposing Diagonal Eyelet

Can be used to hang the bag to empty.

### Non Return Valve

Eliminates reflux and maintains directional flow of fluids

### Stepped Connector

Provides a secure connection to all bags and catheters.

F2-EZ is designed for single use and once the Twist and Snap connector is broken the bag must be discarded.

1. Keep the F2-EZ in the upright position.

2. Hold the bottom half of the connector and with the other hand Twist in a clockwise direction.

3. The top half of the connector should snap off and be discarded.

4. To drain the fluids use the the opposite diagonal corner eyelet and empty. Discard the bag in accordance with hospital policy

# Bag Hanger, Catheter Valve & Bag Holder

## Flexihang bag Hanger

The Flexihang bag hanger is a uniquely designed universal 2 litre urine bag hanger for use on beds fitted with or without side bars. Flexihang can also be secured between the mattress and bed frame in divan bed. The grips incorporated into the hook section of the hanger will provide a positive grip keeping the hanger and bag in position. Flexihang ensures the urine bag is held firmly in place with two snap fit locks and secures the outlet tube in a vertical position to ensure good flow to the bag and reducing accidental separation.

| PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|
| 00-0012 | Flexihang Bag Hanger | 10 |
| 00-0014 | Flexihang Bag Hanger | 100 |

## E-Z Flow Catheter Valve

**The Flexicare E-Z Flow is a discreet lightweight catheter valve designed to offer patients flexibility of choice in urine drainage management.**

**100% Tested**

All E-Z Flow Catheter Valves are 100% tested to guarantee leak free valves

**High User Confidence**

The 90° lever action provides positive assurance of the catheter valve being either open or closed

**Patient Comfort**

The outlet sleeve of the catheter valve is made of soft PVC, that will not put any pressure marks or cause any discomfort for the patient when in situ.

**Secure Fitting**

The ridged connector ensures a secure fit with the catheter.

| PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|
| 00-0060 | E-Z Flow Catheter Valve | 5 |

## FlexiSleeve™ Leg Bag Holder

FlexiSleeve™ is a knitted leg bag holder to replace leg straps. FlexiSleeve™ offers more comfort to the bag wearer by distributing the weight of the bag evenly around the leg or thigh. This will help to reduce any potential pressure sore that could occur with leg straps if fastened tightly. FlexiSleeve™ also helps to dampen the noise created by movement of the fluid in the bag.

| PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|
| 00-0035 | Small size leg bag holder | 3 |
| 00-0036 | Medium size leg bag holder | 3 |
| 00-0037 | Large size leg bag holder | 3 |
| 00-0038 | Extra Large size leg bag holder | 3 |

## Bag Stand and Leg Straps

The Flexicare bag stand is powder coated to ensure that there are no sharp edges.

| PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|
| 00-0022 | Bedside Bag Stand | 5 |
| 00-0032C | Lycra Anti-Slip Leg Straps | 5 |
| 00-0032 | Lycra Anti-Slip Leg Straps | 100 |

# Continence Products

## Overnight Drainage Bags

| PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|
| 00-1200 | **F4 Community Pack**<br>2 Litre Drainable Sterile Bag<br>Inlet Connector, Guarded Sampling Port and T-Tap | 10 |
| 00-1201 | **F4L Community Pack**<br>2 Litre Drainable Sterile Bag<br>Inlet Connector, Guarded Sampling Port and Lever Tap | 10 |
| 00-2202C | **F2**<br>Sterile Bag, Non Drainable,<br>Non Return Valve and Tear to Open | 10 |
| 00-2203C | **F2 - EZ**<br>Non Sterile Bag, Non Drainable,<br>Non Return Valve and Snap Twist | 10 |

| | | |
|---|---|---|
| 00-1204 | **F4 Hospital Pack**<br>2 Litre Drainable Sterile Bag with Inlet Connector,<br>Guarded Sampling Port and T-Tap | 100 |
| 00-1204L | **F4L Hospital Pack**<br>2 Litre Drainable Sterile Bag with Inlet Connector,<br>Guarded Sampling Port and Lever Tap | 100 |
| 00-2201 | **F2 Non Sterile Hospital Pack**<br>Non Sterile Bag, Non Drainable,<br>Non return Valve and Tear to Open | 250 |
| 00-2202 | **F2 Sterile Hospital Pack**<br>Sterile Bag, Non Drainable,<br>Non Return Valve and Tear to Open | 100 |
| 00-2203 | **F2 - EZ Hospital Pack**<br>Non Sterile Bag, Non Drainable,<br>Non Return Valve and Snap Twist | 100 |

## Leg Bags

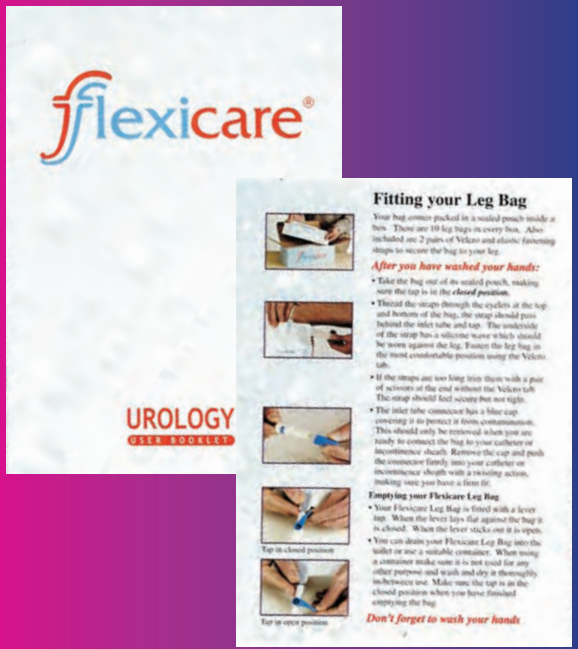
| PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|
| 00-1352 | 350ml Leg Bag Short Tube - Sterile | 10 |
| 00-2352 | 350ml Leg Bag Long Tube - Sterile | 10 |
| 00-1502 | 500ml Leg Bag Short Tube - Sterile | 10 |
| 00-2502 | 500ml Leg Bag Long Tube - Sterile | 10 |
| 00-3502 | 500ml Leg Bag Extra Long Adjustable - Sterile | 10 |
| 00-3501 | 500ml Leg Bag Extra Long Adjustable- Non Sterile | 10 |
| 00-1752 | 750ml Leg Bag Short Tube - Sterile | 10 |
| 00-2752 | 750ml Leg Bag Long Tube - Sterile | 10 |
| 00-1503L | 500ml Leg Bag Short Tube - Sterile without backing | 100 |
| 00-2503L | 500ml Leg Bag Long Tube - Sterile without backing | 100 |

# Home Packs

Flexicare offer a Home pack to patients leaving the hospital and returning home. There are several different Home packs available depending on patient requirements ensuring that they have all the items during their first week away from the hospital.

All Home packs include a user booklet, written by a Continence Advisor designed specifically for patients to ensure they use the products correctly as well as emphasing the importance of hygiene.

The booklet also answers the most frequently asked questions, thus helping the patient in adapting to using continence products.




| PRODUCT CODE | DESCRIPTION |
|---|---|
| 00-0040 | 1 x F4, 1 x F2, 1x 500ST Leg Bag |
| 00-0042 | 4 x F2, 1 x 500ST Leg Bag |
| 00-0045 | 2 x F4L, 1 x 500ST Leg Bag |
| 00-0046 | 2 x F4L, 1 x 500LT Leg Bag |
| 00-0047 | 2 x F2S, 1 x 500ST Leg Bag |
| 00-0048 | 2 x F2S, 1 x 500LT Leg Bag |

# Recommended for Further Reading


1 Kristiansen P, Pompeius R, Wadstrom LB 1983; Long-term urethral drainage and bladder capacity. Neurol Urodynamics (2): 135-143

2 Oberst MT, Graham D, Geller NL, Stearns MW, Tierman E 1981; Catheter management programs and postoperative urinary dysfunction. Res Nurs Health (4): 175-181

3 Lowthian P 1989; Catheters, preventing trauma. Nursing Times 85 (21): 73-75

4 Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, et al. The standardisation of terminology of lower urinary tract function: Report from the standardisation sub-committee of the International Continence Society. Neurourol Urod 2002;21:167-78.

5 Milson I, Abrams P, Cardozo L, Roberts RG, Thuroff J, Wein AJ. How widespread are the symptoms of an overactive bladder and how are they managed? A population-based prevalence study. Br J Urol Int 2001;87:760-6

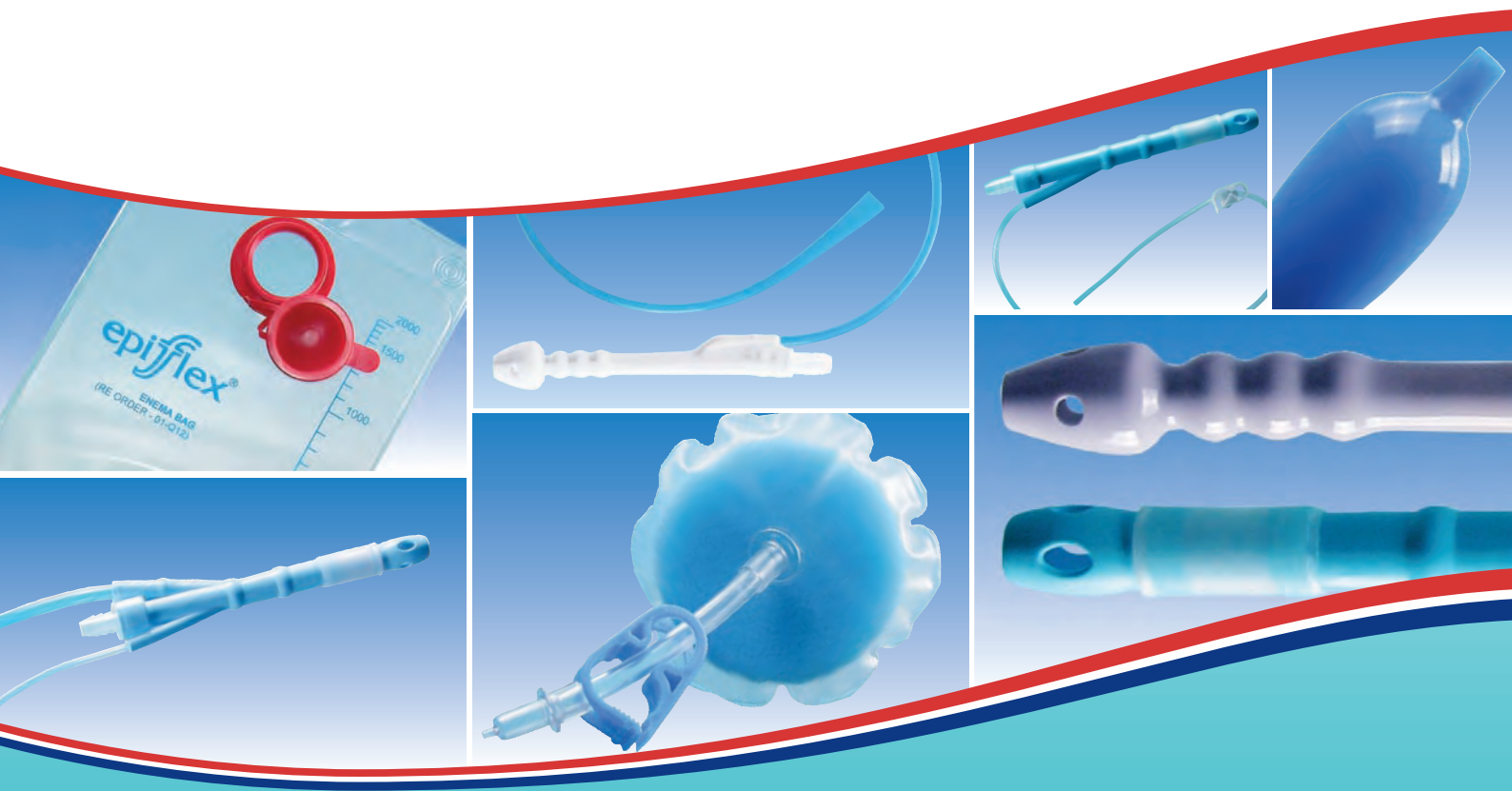
6 Mcghan WF. Cost effectiveness and quality of life considerations in the treatment of patients with overactive bladder. Am J Manag Care 2001;7:S62-75.


**Further Help and Information is also available from**

**The Continence Foundation**
(Helpline 9.30am – 1.00pm Mon – Fri)
Telephone number 0845 345 0165

**Association For Continence Advice**
Telephone Number 020 7820 8113

# Barium Enema Tips and Accessories



epiflex®

Flexicare has been a manufacturer of medical devices for over 30 years and has built a world class reputation for the supply of medical devices to the healthcare market.

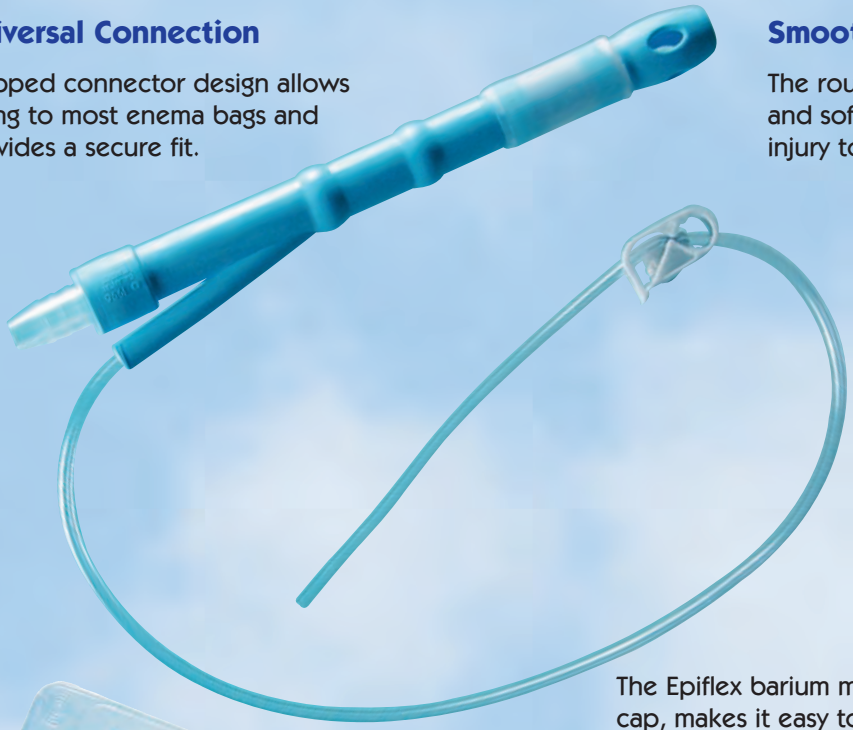
Epiflex is the new range of barium enema tips, bags and accessories providing clinicians with maximum choice. Flexicare offer a wide range of enema tips with choice of cuffed and uncuffed depending on the procedure required.

### Universal Connection

Stepped connector design allows fitting to most enema bags and provides a secure fit.

### Smooth tip

The rounded edge design of the tip and soft material reduces the risk of injury to the patient.

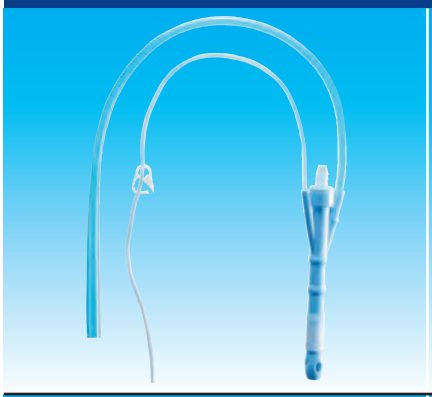
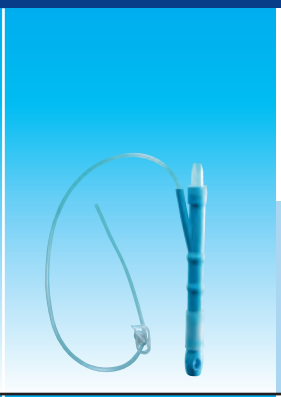
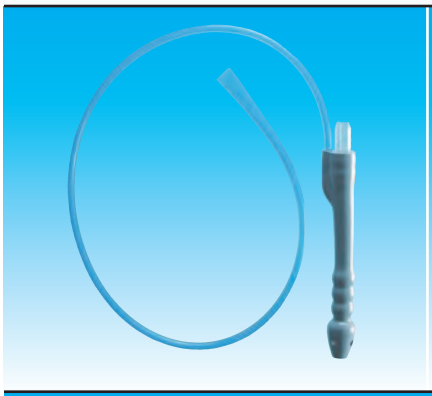
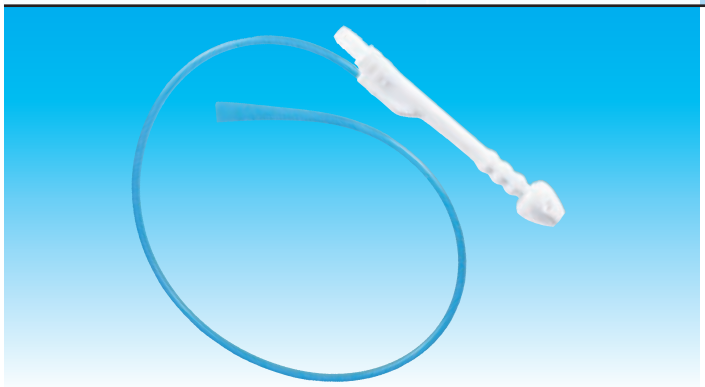


The tips are offered with and without cuff

The Epiflex barium mixing bag with it's large snap fit cap, makes it easy to fill the bag. The floating ball fitted in the outlet tube prevents barium lumps entering the tube before it is mixed.

The outlet tube is fitted with a slide clamp to allow easy opening and closing.

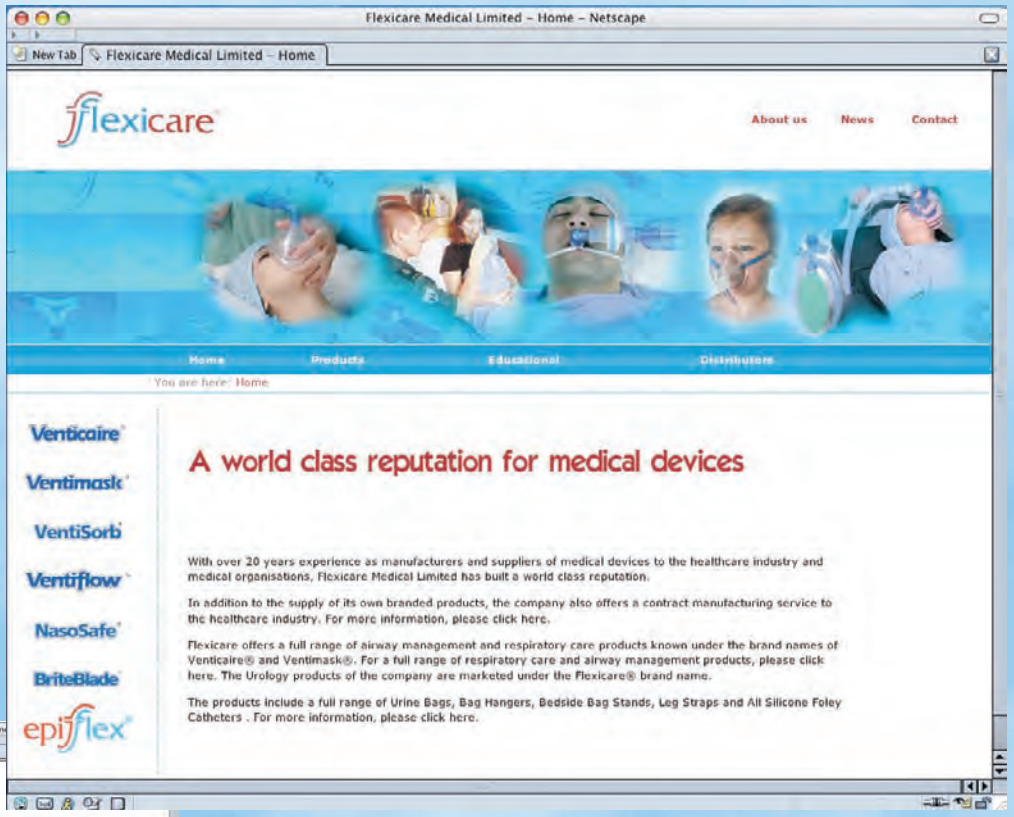
# Barium Enema Tips & Accessories

| | PRODUCT CODE | DESCRIPTION | PACK SIZE |
|---|---|---|---|
|   | 01-Q11 | Cuffed Enema Tip with Air Line and Non-Return Valve | 10 |
| | 01-Q06 | Cuffed Enema Tip | 10 |
|  | 01-Q09 | Standard Enema Tip with Air Line and Non-Return Valve | 10 |
| | 01-Q08 | Standard Enema Tip | 10 |
|  | 01-Q07 | Extra Large Enema Tip with Air Line and Non-Return Valve | 10 |
| | 01-Q12 | Enema Bag | 10 |
| | 01-Q15 | Single Shot Cuff Indicator | 10 |
| | 01-Q14 | Blue Air Puffer | 10 |

**Barium Enema Tips and Accessories are all latex free**

We look forward to providing you with one of the most essential ingredients in the successful implementation of our products and services; a comprehensive in-service training and support package that will allow you to call on us for assistance with confidence.

The Website is continuously updated with the latest information on new product launches, exhibition dates and news.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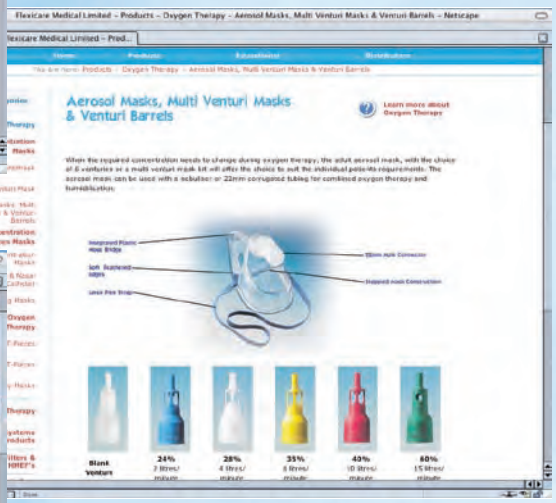

## Clinical Pursuits

is the interactive on-line training programme that allows you to measure yourself in six different categories.

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# Flexicare Worldwide

## Flexicare UK

Flexicare Medical Limited
Cynon Valley Business Park,
Mountain Ash,
Mid Glamorgan.
CF45 4ER

Tel: +44 (0)1443 474647
Fax: +44 (0)1443 474222
Email: enquiries@flexicare.com
www.flexicare.com

## International Sales Offices

Portugal +351 214 926 345/6
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For further information please contact:

Flexicare Medical Limited
Cynon Valley Business Park,
Mountain Ash, Mid Glamorgan.
CF45 4ER
UK

+44 (0)1443 474647 +44 (0)1443 474222 enquiries@flexicare.com

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